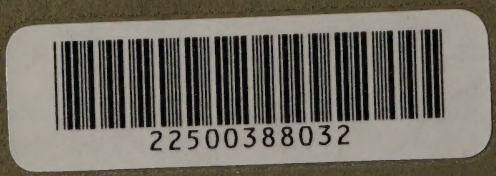

22500388032

BRITISH MEDICAL
Library
ASSOCIATION

INTERNATIONAL

MEDICAL MAGAZINE.

AN ILLUSTRATED MONTHLY, DEVOTED TO

MEDICAL AND SURGICAL SCIENCE.

EDITED BY

HENRY W. CATTELL, A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Pathologist to the Presbyterian Hospital: Senior Coroner's Physician of the City of Philadelphia, etc.

VOL. VI.

PHILADELPHIA, PA.:

INTERNATIONAL MEDICAL MAGAZINE CO., PUBLISHERS,

3709 SPRUCE STREET.

CHICAGO: 612 MEDINAH TEMPLE. LONDON: 136 GOWER STREET, W. C.

1897.

Copyright, 1897, by International Medical Magazine Company.

WELLCOME INSTITUTE LIBRARY
Coll. WelMOmec
Coll.
No.

Printed by New Era Printing Company, Lancaster, Pa.

BRITISH MEDICAL Library ASSOCIATION

INTERNATIONAL MEDICAL MAGAZINE.

CONTRIBUTORS TO VOL. VI.

ANDREWS, JOSEPH A., M.D., of New York.

BANKS, WILLIAM MITCHELL, F.R.C.S., of Liverpool.

BECK, CARL, M.D., of New York.

BEHRENS, B. M., M.D., of Minneapolis, Minn.

BELL, ROBERT, M.D., F.F.P.S.G., of Glasgow.

BENEDICT, A. L., A.M., M.D., of Buffalo.

BIGGS, HERMAN M., M.D., of New York.

BLISS, ARTHUR AMES, A.M., M.D., of Philadelphia.

BURNETT, CHARLES H., A.M., M.D., of Philadelphia.

CATTELL, HENRY W., A.M., M.D., of Philadelphia.

CERNA, DAVID, M.D., Ph.D., of Galveston, Texas.

CHEYNE, W. WATSON, M.B., F.R.C.S., F.R.S., of London.

CUMSTON, CHARLES GREENE, B.M.S., M.D., of Boston.

CURTIN, ROLAND G., M.D., of Philadelphia.

DANFORTH, I. N., A.M., M.D., of Chicago.

FOY, GEORGE, F.R.C.S.I., of Dublin, Ireland.

HEATH, CHRISTOPHER, F.R.C.S., of London.

HINSDALE, GUY, M.D., of Philadelphia.

HOLMES, EDMUND W., A.B., M.D., of Philadelphia.

KNIGHT, FREDERICK I., M.D., of Boston.

MACKENZIE, STEPHEN, M.D., F.R.C.P., of London.

MAYS, THOMAS J., A.M., M.D., of Philadelphia.

MORTON, THOMAS G., M.D., of Philadelphia.

MOYER, HAROLD N., M.D., of Chicago.

NEWTON, RICHARD COLE, M.D., of Montclair, N. J.

O'CONOR, JOHN, M.A., M.D., of Buenos Ayres.

OLIVER, CHARLES A., A.M., M.D., of Philadelphia.

OSLER, WILLIAM, M.D., F.R.C.P., of Baltimore.

PAULIG, FREDERICK A., M.D., of Berlin.

PHILLIPS, W. F. R., M D., of Washington.

RANSOM, CHARLES C., M.D., of New York.

RICHARDSON, G. H., M.D., of Mandalay, Burmah.

RICHET, PROFESSOR CHARLES, of Paris.

RODDICK, T. G., M.D., of Montreal.

SAILER, JOSEPH, M.D., of Philadelphia.

SPILLER, WILLIAM G., M.D., of Philadelphia.

STEELE, J. DUTTON, M.D., of Philadelphia.

STOWE, HERBERT M., M.D., of Chicago.

TAYLOR, A. E., M.D., of Philadelphia.

VAN COTT, J. M., JR., M.D., of Brooklyn.

VAN HARLINGEN, ARTHUR, M.D., of Philadelphia.

WATSON, EDWARD WILLARD, M.D., of Philadelphia.

WHITE, FRANK, M.D., of Elwyn, Pa.

WHITTAKER, JAMES T., M.D., LL.D., of Cincinnati.

WOOD, HORATIO C., JR., M.D., of Philadelphia.

INTERNATIONAL
MEDICAL MAGAZINE.

Vol. VI.] FEBRUARY, 1897. [No. 1.

ORIGINAL COMMUNICATIONS.

A STUDY ON THE VIRULENCE OF THE BACTERIUM COLI IN INFANTILE DIARRHŒA.

BY CHARLES GREENE CUMSTON, B.M.S., M.D.,

Assistant Professor of Surgical Pathology, Tuft's College, Boston; Corresponding Member of the Association of Genito-Urinary Surgeons of France; of the Electro-Therapeutic Society of France, etc.

THE following researches were carried out in the Laboratory of Clinical Medicine of the Faculty of Medicine, at Geneva, during the summer of 1893, and the only reason for publishing this paper is that, so far as our knowledge goes, we are not aware of any experiments having been carried out in this same direction.

The *Bacterium coli*, whose discovery only dates from 1885, when Escherich first described it, has taken a very important place in both medical and surgical pathology. In this study we do not desire to touch upon either the biology of the *Bacterium coli* or its identity with Eberth's bacillus; nor shall we consider the *rôle* of the microörganism in general pathology. We shall divide the subject into three parts: in the first, we will describe the principal characters of *Bacterium coli* from the morphological point of view; in the second, we will go rapidly over the literature relative to its virulence in the intestinal tract; while the third will be devoted to our personal researches, and the conclusions which may be deducted therefrom.

The shape of the *Bacterium coli* is subject to many varieties. In its mean form it is a small rod slightly rounded at the extremities, its length being four or five times greater than its width. It measures from 2 to 3μ in length and 0.6 to 1.0μ in thickness, and is often seen in the shape of a nearly

spherical oval which is, without doubt, a young form of the organism. The elements are either isolated or are united two by two and end to end as if the bacilli hardly touched each other; or the separation is simply marked by a strangulation, which may be imperceptible, and the bacillus thus looks as if it had doubled its length without increasing in thickness. We have often noticed during our researches the ovoid united end to end, and, lastly, a colon bacillus develops in the form of long rectilinear filaments which are undulated or spiral. These filaments have a regular border or are cut up by strangulations indicating the association of the primary elements.

Some cultures are entirely composed of one of these various forms, and the identity of the culture might be doubted if cultures on other media were not made, and if the growths which result were not identical with the first from which they were taken. This polymorphism may exist in the same culture. Old cultures from gelatine usually show short and thin forms, simple or double filaments of variable length and thickness very much larger than those of the isolated element, and between these extremes all the intermediary ones may be found.

The *Bacterium coli* stains very rapidly with all the anilin dyes, but decolorizes very quickly by Gram's method.

When the culture is young the rod absorbs the coloring matter more equally in its entire length; but often, and especially in cultures several days old, the staining is only noticed at the extremities of the bacillus, leaving the remaining part unstained and, apparently, slightly swollen. In the long types the stain occurs in regular zones corresponding to the number of elements making up a filament; nevertheless, the latter may keep a homogeneous coloring in its entire length.

Occasionally it is the middle of the bacillus which alone takes the dye and one or both of the extemities remain decolorized, swollen and round. It has been thought that these decolorizations of the stain were due to the presence of spores in the ends of the bacilli; but careful study of the forms of spores has never reached them in the development of the *Bacterium coli*. In the feces the rods are also long and thin, united two by two and end to end or disposed in small colonies. They are also found in the form of short bacilli and ovoid bodies, as was the case in the greater number of our cases.

The mobility is a constant character of this bacterium and consists in oscillation in every direction on the spot without displacement, but the organism is endowed with a movement of translation called by Professor d'Espine "jumping movement." These movements may vary greatly in their intensity from one culture to another. We have studied the intensity of this movement comparatively with that of Eberth's bacillus, and we think that we can affirm that it never reaches the same degree in the *Bacterium coli* that is found in the bacillus of typhoid fever.

In bouillon the development of the colon bacillus is very rapid. After a few hours in the incubator at 35° to 37° C., the bouillon becomes cloudy and at the bottom of the tube a whitish sediment falls which increases in quantity with the age of the culture.

At the end of one or two days there is to be found at the surface of the liquid a thin pellicle which adheres to the tube, or else constitutes a uniform layer which is easily broken up. After a while the culture stops growing; the bouillon becomes transparent and the mass of microbes falls to the bottom of the tube. In ordinary bouillon the *Bacterium coli* produces an abundant formation of ammonia and the reaction is strongly alkaline. Old cultures have a fetid odor and a brownish color.

On agar (in the incubator at 37°) the culture presents nothing which is characteristic. Inoculation in lines or by inundation is followed in 24 hours by an abundant white, shiny deposit, with a creamy and moist look which grows more in thickness and has little tendency to broaden. On the inclined tube, as in Erlenmeyer's flasks, or on plaques, the isolated colonies are regularly round, forming a small, regular semisphere of an opaque or brilliant white and homogeneous.

After a few days small regular productions having the same color are seen to form, and the bacilli of these productions are identical with those of the striation culture. Stab cultures in agar show a grayish white growth the whole length of the needle track, or in white, round, isolated colonies. Air bubbles often form in the mass of the agar, and we have noticed this phenomenon in line cultures as well. The bubbles of gas are significant of cultures of *Bacterium coli*. On fuchsin agar the culture decolorizes the nutritive media and absorbs the coloring substance.

Potato is a very valuable medium for the *Bacterium coli*. The culture forms at the end of 24 hours a rather thick grayish white deposit, the color *purée de pois*, and the potato takes on a brown color. By age the culture becomes yellower and darker, then a grayish-yellow color, which may exist from the very first appearance of the culture. At the same time the proliferation extends beyond the zone of inoculation and grows out over the surface of the potato, forming a thick, shiny coating with a regular or bossed surface which may measure as much as from 2 to 3 millimetres in thickness. Sometimes there is a development of gas bubbles which, when they break, leave small craters in their place. The periphery of the proliferating culture is often thicker than the central part. In certain cases the culture is poor and does not extend beyond the surface inoculated. It is dry, brilliant or opaque, sometimes of a light or dark yellow, sometimes white and hardly visible, resembling exactly the thin opaline culture of Eberth's bacillus.

Escherich, who has called attention to the almost invisible aspect of the culture of his bacillus, attributes it to the age of the potato. Macaigne has noted this aspect in the case of the *Bacterium coli* taken from choleri-

form enteritis as well as for a *Bacterium coli* taken from a suppurating angiocholitis. The culture was thin, brown and dark yellow. This disposition in a thin, poor culture appears consequently to belong to the pathological *Bacterium coli*. Rodet and Roux, as well as other writers, have remarked for a long time this loss of chromogenic power of the pathological *Bacterium coli*; but in new inoculations the opaline type may be seen to again transform itself into the opaque form. The last mentioned experimenters succeeded in giving the potato the aspect of a culture of the typhoid bacillus by diminishing the vitality of the *Bacterium coli*.

Gelatine is the best medium for studying the polymorphism in cultures of *Bacterium coli* which do not liquefy it. On account of the summer's heat we were unable to employ this medium; but we will quote here a paragraph borrowed from the thesis of Dr. Macaigne, which is a very complete work on this subject. "On gelatine plaques the colonies appear at the end of 23 or 36 hours in the form of small grayish points hardly perceptible to the naked eye." At the end of two or three days the colonies have taken on a typical aspect. In the depth of the medium some round points may be seen which are usually oval, and by a magnifying glass are seen to have a brownish yellow color, showing fine granulations.

The colonies on the surface of the plaque present two absolutely different forms, whose identity would be denied if by culture it could not be proved that one type may produce the other. One form is opaque, the other transparent. Escherich has already mentioned this phenomenon. Lamelle, and later, Krogius, Malvoz, and others, have confirmed it as well. The *opaque colonies* are distinctly limited, semicircular, thick, of a white color and with a shiny, damp aspect. They may reach a diameter of from 1 to 4 or 5 millimetres. The *transparent colonies*, on the contrary, cover the surface in the form of a thin opaline pellicle with a dry surface and bluish hue and may reach 3 centimetres in diameter; though sometimes not more than 4 or 5 millimetres. They are round or polygonal. Their borders are often irregular and broken; under the microscope they present very variable designs; sometimes they are seen like the ramifications of the veins of a leaf; sometimes the radiations start from the centre like spokes of a wheel; or, at other times, they may be star-shaped figures. Often the thin granulations are only found in the central part and the periphery is almost homogeneous.

Sometimes both of these morphological varieties of cultures are associated and the colony presents an opaque white color, slightly projecting and surrounded by an opaline, bluish, non-transparent border finely dentated.

The same plaque may show one or other of these types of colonies; but occasionally both may grow on the same. The opaque variety, when cultivated in milk, or when injected into the peritoneum of an animal, may become transparent (Lamelle). The same differences as in the cultures on plaques are also to be remarked in line cultures on inclined gelatine tubes.

On them may be seen either a projecting opaque band accompanied or not by a scalloped opaline border, the culture forming at the lower part of the line of inoculation an abundant, creamy, damp, viscous deposit; or a thin transparent layer which extends from both sides of the line of inoculation and may reach to the walls of the tube. The borders of this thin culture are formed by more or less large festoons which are decomposed in very fine points.

By stab culture in gelatine the culture grows on the surface as well as in the depth of the medium, as in the case for agar, which indicates that the *Bacterium coli* is both anærobic and ærobic. At the surface a limited opaline pellicle is to be seen with irregular contours, invading all the gelatine, or producing an opaque limited vegetation which sometimes is very exuberant and similar to a nail head. In the depth of the medium a white line is to be seen which, after a few days, appears granular. If the inoculation have been less abundant some isolated lenticular forms will have grown, their color yellow, and reaching the size of pin heads. Around the track of inoculation gas bubbles often form. In old cultures a cloud appears which invades the upper layers of the gelatine. The cultures on gelatine are thin, accompanied by the formation of crystals of ammonio-magnesia phosphates, which penetrate the gelatine.

Lastly, a word must be said regarding the action of the *Bacterium coli* on milk which it coagulates in the incubator at 37°; but at the ordinary temperature this phenomenon may take two or three days; even a week has occurred in some of our cases and in those reported by Welch. This fact is important to remember as a differential diagnostic factor between the *Bacterium coli* and the typhoid bacillus, as the latter does not coagulate milk. This coagulation is produced by the property possessed by the *Bacterium coli* to ferment sugars and especially lactose; and it is perhaps produced by the lactic acid which results from the decomposition of this sugar. The excess of lactic acid ends by stopping the development of the bacillus; but if carbonate of calcium is added the absorption of the acid increases as soon as it is formed, and the culture will continue to grow.

ON THE VIRULENCE OF THE BACTERIUM COLI.

In 1886 Escherich introduced into the thigh of a guinea pig small quantities of the culture of the *Bacterium coli*, which resulted in the death of the animal in 24 hours. At the autopsy he found an intense intestinal catarrh and desquamation of Peyer's patches, as well as circumscribed hemorrhages and hypertrophy of the follicles which are to be found in the neighborhood of the cœcum. Sometimes the spleen was slightly tumefied. By injecting large quantities of the culture, he found, besides these lesions, a serous exudation in the peritoneal cavity. Escherich also remarked that the hypodermic injections of his bacillus produced the same results as intravenous inoculation when the doses inoculated were very large.

Wurtz and Hermann, experimenting on the comparative effects of the *Bacterium coli* and the bacillus of typhoid, made the following remark regarding its virulence: "The effects produced by experimentation on the guinea pig have only all the more convinced us that it is not possible to differentiate the typhoid bacillus from the *Bacterium coli* by this method."

"Three guinea pigs were inoculated in the pleura with 4 cubic centimetres of culture of the *Bacterium coli*; the culture was in bouillon and 24 hours old. All three animals died the next day, after having presented a severe diarrhœa. At the autopsy an abundant sero-hemorrhagic liquid was found in the pleural cavity with congestion of the lower lobes of the lungs; intense intestinal catarrh; ecchymosis of the mucosa and tumefaction of Peyer's patches. The dose of the culture injected having appeared to us rather large, we repeated the experiment with two guinea pigs, inoculating only a cubic centimetre of the same culture in each animal. Both of these animals died with the same lesions at the end of from 20 to 32 hours."

It is to be regretted that these experimenters did not give the source from which they made their cultures, because according to whether one is dealing with the *Bacterium coli* coming from a normal movement, or from a diarrhœa, the virulence is entirely different, as we shall demonstrate further on in some of our cases. The following is the manner in which Lesage and Macaigne express themselves regarding the influences of diarrhœa on the virulence of the *Bacterium coli*.

"As soon as a diarrhœa is established, the *Bacterium coli* acquires a certain virulence and inoculated in normal doses such as indicated above it becomes pathogenic; for the rabbit a cubic centimetre subcutaneously and in the venous system in the guinea pig 1 cubic centimetre subcutaneously, and in the mouse from 5 to 10 drops subcutaneously. Thus rapid infection may be obtained from the *Bacterium coli*, followed by death in from 24 to 48 hours, an infection well described by Escherich. As we obtained nothing with the *Bacterium coli* from the normal intestine and as we produced a septicæmia with the *Bacterium coli* coming from a diarrhœa, we concluded that the *Bacterium coli* of diarrhœa has acquired a virulence. Therefore when this organism is studied, it is necessary to inquire into the condition of the intestinal tract."

"We have examined 49 cases of diarrhœa in children; 36 were positive; 13 gave no results. *There are consequently cases of diarrhœa in which the normal Bacterium coli does not possess an exalted virulence.* In order to explain the negative results we thought that it was necessary to consider the influences of summer, because these negative cases were observed in winter and without much chance to demonstrate the influences of the summer's heat on the virulence of the *Bacterium coli*, as in 3 of the already mentioned cases in which the normal *Bacterium coli* killed animals in from 3 to 5 days, one of them was in May and two in August;

while the 13 negative cases occurred as follows: 8 in winter and 5 in summer. What is the influence of the various forms of diarrhœa? What is the influence of a purgative? These are considerations which should be studied. In a case of diarrhœa produced by antimony, the *Bacterium coli* was virulent. The 13 negative cases that we have spoken of upholds the opinion that the normal *Bacterium coli* in no way influences animals."

Blachstein experimented on the virulence of the *Bacterium coli* by intravenous injections and we here give a short *résumé* of his results. The injection of an emulsion of the organism into the auricular vein of the rabbit caused death in certain cases according to the quantity in each and the toxic power of the culture injected, as well as the idiosyncrasy of the animals. When death occurred after a few days the organism was especially found in the liver, the spleen, and the bile.

With other animals, some lived, and some that died showed nothing at the autopsy; while others succumbed at the end of from 8 to 20 days with lesions of marked infections; the greater part of the viscera were normal; the liver alone presented a certain number of necrotic and cirrhotic foci containing the bacillus injected. The bile was watery and colorless, containing flakes made up of necrosed cells and the *Bacterium coli*, which was still living and could be cultivated. The blood of the animal remained sterile.

We now come to the memoirs of Rodet and Roux, and we will reproduce that part concerning the virulence of the organism under consideration.

"In the guinea pig, the dose of a cubic centimetre of a bouillon culture usually caused death. The delay of death was variable, according to the activity of the bacillus employed. Some animals lived more than a week; but the greater number succumbed very much quicker and were found dead after 24 hours."

"We employed bacilli taken from various sources, such as feces of healthy men, from typhoid dejections, from privies, and lastly, one culture of the bacillus was taken from a suppurating lesion of the breast."

"Here is an example of the lesions found in these animals in an experiment performed under our direction by Dr. Vallet. On May 8, 1891, two guinea pigs were inoculated in the peritoneum with a cubic centimetre of a bouillon culture of a *Bacterium coli* which had been taken from a privy; and in three others the same quantity of a culture taken from feces of a healthy man. One of the animals which had received the culture taken from the privy died in 24 hours and presented the following lesions: An abundant sero-sanguinous collection in the abdominal cavity; general congestion of the peritoneum with some ecchymoses, fibrinous concretions around the spleen, which was considerably tumefied and nearly black in color; a certain number of small, white grains in the liver which

were no less than small abscesses developing; a sero-sanguinous exudation in the pleura and in the pericardium; a tumefaction and marked congestion of Peyer's patches, one of which was brownish, ecchymosed and presented a slight ulceration on one of its borders. The *Bacterium coli* was found not only in the peritoneal exudation, but also in the blood. The other guinea pig which was injected with the bacillus coming from the privy died on the fourth day and presented very similar lesions, but not quite so marked. The three animals which were injected with the *Bacterium coli* from the normal intestine died in 2, 8 and 11 days with hypertrophy of the spleen, congestion of the liver, and tumefied and vascular Peyer's patches."

These writers point out that the rabbits showed themselves less sensitive to the intraperitoneal injections than the guinea pigs. Nevertheless, following this manner of inoculation, the animals died after several days, sometimes several weeks, during which time they had diarrhœa. At the autopsy, tumefaction of the spleen and swelling of Peyer's patches were found; but the lesions were much less marked than in the guinea pigs. The venous injections were virulent. A very important fact is that the *Bacterium coli* does not always produce all the lesions in the same subject and their intensity may be very much less. But this is the way they sum up the lesions produced by the *Bacterium coli* in the guinea pig and the rabbit, according to their experiments: "Tumefaction of the spleen, congestion of the intestines and the peritoneum with sero-sanguinous exudation in the peritoneal cavity, false fibrino-purulent membranes covering the serosa especially over the surface of the liver and the spleen, swelling of Peyer's patches, which are vascular, ecchymosed and even ulcerated; exhalation of free liquid and gas in the intestine; a serous collection in the pleura and pericardium (we once even saw a pneumonia); abscesses of the liver and spleen (exceptional);" and further on these writers say: "The intensity of the lesions varies notably from one *Bacterium coli* to another. Sometimes animals may die, so to speak, without any lesion, without notable tumefaction of the spleen, and in these cases, the toxicity is very marked, but the infectious power, properly speaking, is at its minimum. Of all the different varieties of *Bacterium coli* with which we experimented, the one which came from the privy possessed the greatest activity of pathogenic power; that is to say, as regards the intensity of the lesions. The virulent power of this microbe does not appear to be a simple affair. It has other qualities which must also be distinguished, such as the pyogenic, which we found at its maximum in the *Bacterium coli* contained in a renal suppuration; but it appears that this was only a temporary property. In our other experiments with this microbe, which was so eminently pyogenic in the beginning, we have seen it lose this peculiarity and no longer produce lesions which would distinguish it from the same organism taken from another source."

Krogius experimented with the virulence of a *Bacterium coli* taken from pathological urine, and, by inoculation into the peritoneal cavity of guinea pigs, he found that the animals died in less than 29 hours. At the autopsy they presented the same intestinal lesions mentioned by Rodet and Roux; but, besides, Krogius met with the same lesions, although less marked, when the inoculation was made in the veins. The same signs of intense enteritis were observed in the rabbit and white mice inoculated in the same way.

We now come to the researches relating to the virulence of the *Bacterium coli* in cholera nostras and infantile diarrhœa.

In 1887 Hüppe described the case of a child, who, after having taken a large quantity of cold beer, was taken suddenly with a severe riziform diarrhœa, cramps in the legs, cyanosis and choleric facies, but who recovered in two days. A rod-formed organism was found in the feces, which resembled the *Bacterium coli;* but this writer is not sure whether he really was dealing with this microbe, because in 1887 the properties of this bacillus were not known; but to-day, taking into consideration the bacteriological description of this case as well as the clinical symptoms, it is probably certain that it was the *Bacterium coli.* The author emitted the hypothesis that the virulence was produced by a chemical change in the intestines, this modification being the result of a change in regimen.

The first categorical indication regarding the *Bacterium coli* as an etiological factor of cholera nostras is due to Gilbert and Girode. We will quote from their memoir:

"In the guinea pig, at any rate, the simple injection of a culture of the *Bacterium coli* may be followed by *experimental cholera nostras*, which is typical, as the following facts will show: On September 16, 1890, we gave to two guinea pigs $2\frac{1}{2}$ cubic centimetres of bouillon, which had been inoculated for 24 hours with Escherich's bacillus, which had been procured from the riziform feces of our last patient. Both the animals were without anything to eat during the day. One died on October 24th, the other on the 25th, after having had diarrhœa, accompanied by perianal irritation."

"In both cases the autopsy gave the same results. The small intestine was collapsed and of a bright red color. Its cavity was filled with a greenish-white plug made up of mucus and strongly alkaline in reaction and which, when placed in a little water, gave it a riziform aspect. The end of the ileum showed projecting, and congested Peyer's patches."

"The large intestine contained a quantity of greenish-yellow granular liquid. The stomach was empty and retracted. The spleen, the liver, and the mesenteric glands were increased in size. The bladder was distended by a turbid urine. The peritoneum and the thoracic viscera were normal. The contents of the small intestine and the cecum, the blood from the liver and the spleen, and the urine were inoculated in both cases and gave

pure cultures of the colon bacillus. On the same day we gave to two guinea pigs some cholerigenic bouillon to eat, and directly afterwards we injected 10 drops of the same bouillon into the peritoneal cavity of a third male guinea pig, which had had laparotomy performed for the occasion. This animal rapidly lost strength and stopped eating; his condition then remained stationary. In three days he commenced to get better and finally was completely well. Desiring to find out if the choleric power of the bouillon administered to the guinea pig by the mouth was inherent to the conditions in which it had been collected, we gave on January 10th, 1891, 128 drops of bouillon which had been inoculated for 11 days with the *Bacterium coli*, to two guinea pigs of the same weight. One of the bouillons had been inoculated with a bacillus extracted from normal feces, while the other was inoculated with the organism taken from cholera stools. On the 21st, 27th and 28th of January we again gave to each of the guinea pigs 78, 80 and 75 drops of the same cultures, aged respectively 22, 25 and 30 days. Now the guinea pig which had ingested 361 drops of bouillon inoculated with the bacillus coming from the normal feces remained perfectly well; on the contrary, the animal which had ingested 361 drops of bouillon inoculated with the bacillus taken from the cholera feces lost strength rapidly and died on February 5th."

"At the autopsy the stomach was found empty and contracted, its mucosa lined by a thick layer of concrete mucus; the small intestine was collapsed and was congested in its upper quarter; the cavity of the intestine was empty in its entire length; the intestinal mucosa was also covered by a greenish mucus; the lower Peyer's patches were hypertrophied; the cecum was distended by a greenish brown substance and near the junction of the ileum persented a lenticular ulcer; lower down the large intestine was collapsed and empty; the glands of the mesentery were increased in size and black; there was retention of turbid urine; an increase in the size of the spleen, especially in thickness; and lastly, a congestion of the posterior part of both lungs."

These writers conclude that the cholerigenic power belongs to the microbe extracted from the cholera feces; that it is a question of virulence, and that in this question rests the explanation of the development of the cholera nostras, and not in the presence of the bacillus, which is of the ordinary kind; and it should not be concluded from their results that they have obtained a distinction in the species with which they experimented.

In the same year Chantemesse, Legros, and Vidal reported a case of fatal cholera nostras. The inoculations made from the bile and the intestinal contents gave pure cultures of the *Bacterium coli*. They inoculated two rabbits in the veins with a culture of the bacillus. Both of these animals died in 48 hours from a septicemia produced by the colon bacillus which was found in the organs. Two guinea pigs inoculated in the peritoneum died in 24 hours, and at the autopsy showed a sero-fibrinous peritonitis.

Macé and Simon, in a case of infantile cholera resulting in death, in a subject aged 18 months, found the *Bacterium coli* in a pure state in the feces.

Kirchener examined bacteriologically 16 cases of cholera nostras, 3 of which were fatal. In a mother and her child he found in the contents of the intestines, among other microbes, a rather large streptococcus and a very long spirillum. The latter was very abundant, and in spots formed regular stripes; but at the autopsy of the only child which died he did not find this organism in either the blood or the organs. On gelatine plaques these spirilla did not develop. Other colonies in the form of light-colored drops belonging to the streptococcus developed perfectly in bouillon. This writer found some streptococci in the case of cholera nostras in a lady who had come from Hamburg at the time when Asiatic cholera raged in that city.

In none of these 16 cases could Kirchener discover the vibrio of Finckler and Prior; but he always found the *Bacterium coli* with the other saprophytes, and this organism never showed the slightest trace of a curve.

Lesage, basing his work on 22 cases, examined from the bacteriological point of view, arrived at the conclusion that the *Bacterium coli* is the etiological factor of these virulent enterites as well as of the secondary broncho-pneumonia so often observed during their presence, and in this we thoroughly concur, as we will demonstrate in the report of Case 13.

Rosi Doria, in a large series of cases of summer diarrhœa in children, a disease which so easily passes into infantile cholera, found the *Bacterium coli* pure, or nearly so, in the feces and in the viscera. In 24 autopsies that he performed all measures were taken in order to prevent cadaveric invasion of the organism by the bacillus in general, a thing which does not occur, as Lesage and Macaigne have demonstrated, before 24 hours after death, if the surrounding temperature is not too high.

Levine, of St. Petersburg, observed at the beginning of the summer of 1893 some cases of disease leading him to suppose that he was dealing with Asiatic cholera. The patients had diarrhœa, vomiting, cramps, cyanosis, and retention of the urine. Some of them died. Nevertheless, an attentive study of these cases showed him that he was dealing with cholera nostras. This writer studied and bacteriologically examined the intestinal contents of four patients at the Obukloff hospital. He gives one of these cases as an example. The three others were exactly the same. A soldier aged 54 years was attacked with diarrhœa on April 3d and entered the hospital in the morning with the following symptoms: Vomiting, diarrhœa, cramps in the legs, loss of strength, aphonia, stupor, and cyanosis. The patient died the afternoon of the same day.

At the autopsy a parenchymatous fatty degeneration of the muscles of the heart was found, as well as hyperemia and edema of the lungs, acute hyperplasia of the spleen, fatty infiltration and parenchymatous degeneration

of the liver, hemorrhage in the mucous membrane of the stomach, acute hemorrhagic colitis, parenchymatous degeneration of the kidneys, and hyperemia of the pia mater of the brain. The intestinal canal contained a rather yellowish liquid which was stained on slides and examined under the microscope; but it appears that no comma bacillus could be found by that process and cultures were made on gelatine and agar.

Desirous of isolating as quickly and as exactly as possible the microbes of either true or supposed cholera, the author made inoculations on the above mentioned media without excess of oxygen. By this process he did not find the typhoid bacillus, for the cultures were nearly always composed of *Bacterium coli* either pure or nearly so. These rods inoculated on the potato, gave a culture presenting all the characteristics of the *Bacterium coli*; that is to say, they were nearly white, as if covered with varnish. According to Macaigne such cultures are due to the *Bacterium coli* taken from pathological cases, while the same microbe extracted from a healthy intestine gives a thick, brownish culture on the potato, looking very much like a *pureé de pois.*

The virulence of the *Bacterium coli* found in these cultures was tested on animals. For example, a cubic centimetre of the emulsion of the culture on agar, aged two days, was injected into the jugular vein of a rabbit. The animal had a general *malaise*, diarrhœa, cramps, and died in 40 hours. At the autopsy a hemorrhagic inflammation of the cecum and the beginning of the large intestine, tumefaction of Peyer's patches, swelling with extravasation of blood in the mesenteric glands, and degenerated liver were found. The uterus was gravid and presented a hemorrhagic endometritis.

The blood and the liquid taken from the liver were inoculated on culture media and produced the *Bacterium coli.* All these four cases should be considered as cholera nostras; but as they had some symptoms common with Asiatic cholera the author mentioned some distinctive symptoms. The fecal matter of a patient contained much pus; in another the temperature in the axilla was high; and lastly, the paralytic phenomena were present in another case in the arm and the muscles of the eye. According to the researches of Gilbert and Lion, the toxic products of the *Bacterium coli*, when injected into animals, sometimes provoke paralysis in the posterior limbs. From the bacteriological point of view, cholera nostras is not as yet completely elucidated; but many personal experiments, and especially those of Gilbert and Lion, would lead the writer to believe that the *Bacterium coli* plays a very large part in its etiology.

An important article by Marfan and Marot has also been published and, as it treats of the infection produced by the *Bacterium coli* in dyspepsia of nursing children, we would say a few words regarding it. Bacteriological examination made on 18 subjects showed that in chronic gastro- and intestinal dyspepsia of nursing children the organism is very often in-

vaded by bacteria. They also found the very frequent presence of the *Bacterium coli* and less frequently that of the streptococcus, a fact which we completely uphold after the results of our personal researches.

Out of the 18 cases of chronic dyspepsia the examination once showed the absence of the *Bacterium* and the streptococcus; and 9 times the above-mentioned writers found the colon bacillus alone; 4 times the streptococcus alone and 4 times the *Bacterium coli* and the streptococcus combined in the same individual. Lastly, in chronic dyspepsia of nursing children submitted to artificial feeding, secondary infection is not rare but very frequent. Here, still, we are of the same opinion as Marfan and Marot. Out of our 13 cases, 3 had secondary broncho-pneumonia. The two micro-organisms found invaded the economy in these cases; the *Bacterium coli*, which probably traversed the intestinal mucosa and invaded the organism by the lymphatics or by the blood; the streptococcus, which perhaps penetrated by the intestines or by the ulcerations on the cutaneous surface, or by the respiratory tracts. These secondary affections are in general broncho-pneumonia, pulmonary congestion, and acute febrile diarrhœa. It is to be assumed that they take a large part in the genesis of chronic cachexia, whether this takes or does not take the form of Parrot's athrepsia.

And lastly, before closing this chapter, we would mention two cases of intestinal infection by the *Bacterium coli* communicated by Professors Fede and Melerba, the interest of which is great.

The first case was a child who had been well up to the age of four months. The digestive functions were excellent and the nurse was a strong and robust woman. In the month of June, 1892, the child began to suffer from an atypical fever, oscillating between 37.5° and 38.5° and lasting for three or four days; after this time it disappeared, only to reappear at the end of four or five days with a similar temperature, which was afterwards very much higher, oscillating between 37.5° and 40°. After three or four weeks the child showed nothing abnormal excepting a certain paleness and emaciation, as well as a slight intestinal tympanism. There was sometimes constipation; sometimes little greenish liquid stools. From time to time there was somnolence at the time of the fever. All the organs were healthy. At the beginning of July the fever became higher, oscillating between 39° and 40°; but this time it was of a continued temperature. Twice there was notable lowering of the temperature, reaching 35° in the axilla with coldness of the extremities and a slight cyanosis of the lips and the finger tips, a small and frequent pulse, somnolence, and signs of apparent collapse. This condition lasted some hours and stopped after an aromatic drink had been given and counter-irritation had been applied to the skin. The child commenced to pass with the stools cylinders having the shape of the intestine and of a mucoid appearance, in length from 1 to 2 centimetres and rather greenish-yellow in color. Towards the end of July the dejections became more frequent and one day the patient passed cylinders measuring from 10 to 15 centimetres in length. Now, as this drew the attention of the writers, they introduced the longest of these cylinders into a test tube which had been sterilized, in order to examine them. The condition of the child after the more or less abundant emis-

sion of these intestinal formations was better for a few days. The fever was slight as in the first period with apyrexia which lasted three to four days. The intestinal phenomenon stopped little by little; the child increased in weight; and in the first fortnight in August it could be considered as cured.

Chemical and Bacteriological Examination of the Membranous Cylinders.—These presented the shape of the intestine. They were transparent, of a greenish-yellow color and of a soft consistency. They were easily broken to pieces. Their odor was *sui generis*, recalling the fatty acids. The reaction was clear acid. Although they looked very large, these cylinders were so small that a chemical research was not possible. However, albuminoid reactions were obtained. Microscopical examination made in different ways showed a pure culture of a single bacillus. The largest cylinder was opened with sterile instruments and some fragments of the middle were taken on a platinum needle, transported to distilled water and then inoculated on gelatine plaques. All these plaques presented after three days in the incubator at 24° colonies of one kind only, excepting on one plaque where an accidental foreign growth had developed. Consequently, it was known that in these intestinal formations there was but one kind of organism. These colonies, as well as those inoculated on a potato, were characteristic of the *Bacterium coli*, and the microscope demonstrated that the writers were in the presence of this bacillus.

Several rabbits were inoculated with these cultures subcutaneously as well as in the peritoneum and in the veins. An elevation of the temperature varying from 1° to 1½° was obtained. The rabbits inoculated with 1 or 2 cubic centimetres of a twenty-four-hour culture, or one several days old, only showed an elevation of the temperature and, after two or three days, they were completely well. Those which received 5 or 6 cubic centimetres of a culture one or two weeks old, beside the elevation of the temperature, presented an appearance of somnolence, and some even died in a comatose condition.

The second case was a little girl, ten months old, whose parents were well and whose antecedents were good. On the 26th of May, after a greenish-yellow stool, the child was taken with an eclamptic convulsion which lasted more than one and a-half hours and which occurred again and lasted longer. Afterwards several other attacks occurred. The following day the child was better; but she had the same sharp convulsions, which were repeated, and she fell into a semi-comatose condition on account of loss of strength.

When she entered the hospital she was very weak, nearly immovable. The pupils reacted slightly to light; the skin was pale; the temperature was below the normal. A complete examination of the patient revealed nothing. It remained then to find out if it was the nervous system or the intestine which produced these serious symptoms. Three enemata of 200 grammes each in a 1 per cent. solution of boracic acid and an aromatic drink by the mouth were given. The enema brought back a greenish matter with a very fetid odor. Improvement was from this time progressive and rapid. Two days later the child left, cured, and was seen eighteen days later, when it was found that she had increased ten grammes in weight each day since leaving the hospital.

These writers made cultures on gelatine and on the potato which gave Escherich's bacillus pure, and from these two cases they drew the following conclusions: that it was the *Bacterium coli* which produced the pathological phenomenon; that the cure was obtained by enemata which brought

away from the intestine the masses of this organism; and lastly, that the inoculations in animals have proved the virulence of this organism.

After this *résumé* of the researches carried out regarding the virulence of the *Bacterium coli* of the feces, we think that, since its discovery, its virulence has not been questioned. It now remains for us to show in our next paper that in the summer diarrhœa of children *this virulence is proportional to the degree of gravity and the tenacity of the diarrhœa*, which we will endeavor to prove in what follows.

(To be continued.)

THE SURGERY OF THE PROSTATE GLAND.[1]

BY GEORGE FOY, F.R.C.S.I.,
Dublin, Ireland.

On February 20, 1806, Mr. Everard Home read a paper on "Enlargement of the Prostate Gland" before the Royal Society of London, from which date the scientific treatment of enlargement of the gland may be said to have commenced.

Long prior to this, however, diseased conditions of the gland had attracted the attention of anatomists and surgeons. The thirty-seventh letter of Morgagni deals with the question of prostatic calculi, and he quotes cases which occurred in the practice of well-known surgeons, among others naming James Douglas, and writes of the secondary effects of enlargement thus: "When sabulous and viscid matter abounds, particles of them remaining after the last drop of urine has been expelled may sometimes concrete at the part where a hollow is occasioned by the projection of the prostate gland in the male, and of the corpus glandosum in the female, and here it may acquire an annular form as if it had been cast in a mould"—a condition of affairs which actually came under the notice of Sir Henry Thompson more than one hundred years after. The forty-sixth letter of the marvellous collection gives the case of an old man, the middle lobe of whose prostate gland resembled a pear, and he remarks: "How far the prostate gland is liable to excrescences which raise themselves up from its superior circumference, or all around, or from a certain part, into the cavity of the bladder, it would be very easy for me to show." He quotes from Fantonus the case of a man, sixty years of age, who, "having died, after a long-continued and troublesome stillicidium of urine, had the prostate not only purulent, hard and immoderately tumid, but protruded far and wide, toward the lower part of the bladder; also the capacity of the bladder was very small and the membranes were very thick." Trouble-

[1] Read before the Southern Surgical and Gynecological Association, November, 1896.

some retention of urine occurring occasionally is particularly dwelt on by Morgagni as a symptom of enlarged prostate. Indeed, dysuria is mentioned in the thirty-first aphorism of Hippocrates as one of the troubles of old age. As we read the clinical pictures of the suffering entailed by the enlargement of the gland, we cannot help being surprised to find how little the older surgeons did to relieve this very common and distressing disease. Although the general level of surgery was low in the 15th, 16th, 17th and 18th centuries, there were withal "giants in those days," who found light in darkness. In 1490, a date prior to the memorable first journey of Columbus, the kidney was excised from an archer of Baguolet; in 1560 Rouset repeated the operation; and in 1652 Domenico Marchetti, of Padua, performed the operation on Mr. Hobson, H. B. M.'s Consul in Venice. "The very excellent Fantonus" excised the spleen of a woman, "who lived for five years after the operation; and, having conceived and brought forth in the meantime, lest anyone should doubt of the extraction of this viscus, no spleen was found in any part of the body upon dissection; only cicatrices appeared in the neighboring parts, to which it is wont naturally to adhere."

Colot, in 1475, by permission of Louis XI., performed suprapubic lithotomy successfully as an experiment on a criminal, and Pierre Franco performed the same operation in 1556 on a child two years old. Sculletus, 1661, pictures and describes laparotomy, suture of the peritoneum, and the use of the catheter; the introduction of which instrument, for the relief of prostatic retention, Sir Benjamin Brodie considered was due to Sir Everard Home. Mary Donnelly, "a handy woman," a native of the little village of Clogher, in the County Tyrone, in January, 1738, successfully performed cæsarean section on Mary O'Neale, of the same place. Percival Pott opened the longitudinal sinus to relieve a headache; and O'Halleron, of Limerick, slit the corpus callosum from its anterior to its posterior border, simply to test the truth of Descarte's theory as to its being the seat of the soul. The history of the operations for aneurism by Antyllus, Anel, and Hunter does not need telling. But the memory of John Bell suffers from the greater glory attained by his pupil, the distinguished Virginian, McDowell, the ovariotomist, whose courage, dexterity, and self-possession in the presence of danger, had, I think, their genesis in the example of his great teacher, who, to remove foreign bodies or liberate purulent fluid, did not hesitate to cut freely into the pleura and even into the pericardium.

Littre, whilst yet a young man, performed cholecystenterostomy, and McKeever, of this city, in 1824, successfully removed eighteen inches of small intestine (ileum) from a parturient woman. No cavity or viscus escaped the surgeon's knife—the bladder was opened by Pierre Jacques, by Raue, by Chaselden, the prostate gland was torn to shreds by the Marian lithotomy operation; and, as late as 1816, Sanson revived the old method of cutting into the bladder from the rectum.

How can we explain the fact that operative interference for the relief of retention due to enlargement of the prostate—so common, so painful, and so dangerous—was neglected? Two things, I think, contributed to this neglect—(*a*) the theory ascribed to Hippocrates, that wounds to membranes were fatal, and (*b*) the dread of urine coming in contact with the fresh wound; and, we may add, the dread of wounding the peritoneum, which surgeons had at the beginning of the century. All attempts to reach the bladder by the suprapubic method incurred the risk of wounding the peritoneum. The membrane, occasionally, was found to fall over the anterior surface of the bladder. Kirby found and described such cases; but the surgeon who would cut down on an iliac aneurism and remove the peritoneum from the blood-vessels would, nevertheless, dread a fold of peritoneum on the bladder surface, and by preference would open the bladder through the rectum. It is hard to understand this state of mind.

John Hunter came very near revolutionizing the surgery of the bladder when he tapped the viscus and afterward cut down on the canula, sutured the wound, and allowed the bladder to fall back into the pelvis. Hunter was, however, in no mood for pondering on the operation and its success; he remembered only the fact that, acting on the diagnosis of a friend, he had made a mistake. When Hunter died the last hope of progress for many years was lost. Brodie, who made the dissections for Sir E. Home, could only propose tunnelling the enlarged prostate—an operation which quickly fell into discredit when Mr. Barnsley Cooper, in 1851, published his case of fatal hemorrhage following the perforation of a diseased third lobe. A step in the right direction was, however, made when Sabatier recommended a long catheter "with a very long beak" in cases of prostatic disease. Hoping to avoid the trouble of frequently passing the instrument, M. Cruveilhier recommended that the catheter be retained in the urethra, and, practically, nothing more was done for many years. Patients were condemned to a life of catheterism—a condition which to the leading surgeon of the day, Sir B. C. Brodie, appeared very tolerable.

Brodie died in 1862, when anesthetics were being universally used, and the rising generation of surgeons, no longer trammelled by authority and armed with chloroform, commenced to seek for some more promising remedy than the prostatic catheter.

Dieulafoy, 1870, introduced his aspirator and who has not felt the advantage of having such a prompt method of relief for the poor agonized victim of an enlarged prostate? How different from the oft-repeated attempts to pass catheters, small and large, and all the delay and inconvenience of getting the patient into a hot bath, and so forth. Aspiration is, however, simply a palliative measure. M. Mercier, whose prostatic catheter is so well known, was perhaps the first to recommend prostatectomy, which he performed by passing his inciseur along the urethra until it came to the bar of tissue which passes between the lateral lobes of

the gland. The operation was little more than a modified urethrotomy, but it was a step in the right direction, one fruitful of good, "a cloud no bigger than a man's hand," yet destined to fall in showers of blessings on suffering humanity.

To Gouley, of New York, is due the credit of recognizing that incising the prostate was insufficient, and to carry out his idea he devised an instrument with which he punched out obstructive portions of the gland. Mr. Harrison's paper, read at Copenhagen, in 1884, on the treatment of prostatic obstruction by section of the gland was a marked advance, and told that the current of surgical thought was in favor of radical measures being adopted.

The advantage of aseptic surgery had now come to be recognized, and the peritoneum no longer frightened surgeons. Dittel, in 1885, performed suprapubic prostatectomy, and he was followed in the innovation by Trendelenburg, Belfield, Schmidt, and McGill, of Leeds. Three cases by the latter were brought before the Clinical Society of London, on November 11, 1887. After the usual suprapubic cystotomy, "the growth was removed partly by cutting with scissors or with a strong cutting instrument which he (Mr. McGill) devised for the purpose." The same volume of the Clinical Society's Transactions (Vol. XXI.) contains an account by Sir Henry Thompson of an enormous prostate, which so inconvenienced the patient, a man sixty-four years old, as to make his life miserable. "He passed all, or nearly all, his urine by catheter, requiring it every hour and a-half, night and day." This case is of more than ordinary interest, for in November, 1885, Sir H. Thompson had by a perineal incision made a digital examination of the bladder, divided a stricture by internal ureterotomy, "so as to pass a No. 15 (English size) metal dilator with ease," yet in 1886 he had to pass a catheter, "on the average, twenty times in twenty-four hours." His condition became so bad that suprapubic cystotomy was performed on April 29, 1886. In April, 1887, he walked into Sir H. Thompson's rooms, "looking the picture of health." "Owing to the dread of urine infiltrating the tissues, he wore a silk web, gum-elastic tube, which connected the interior of the bladder with an ordinary urinal attached to his leg."

To the great advantage of digital exploration was soon added the sense of sight; and whether we give credit to Mitze or Leitar for the introduction of the cystoscope, or divide the honors between them, we cannot but recognize the immense value of the instrument which enables us to explore the cavity of a viscus as perfectly as we may examine the mouth.

A prostatic hypertrophy may prevent the introduction by the urethra of the cystoscope, but in doubtful cases an exploratory cystotomy and the introduction of the cystoscope through the wound are not only justifiable, but demanded.

Casper, of Berlin, like other surgeons, wishing to avoid the hemorrhage

which occasionally attends prostatectomy, has tried to bring about a diminution of the enlarged prostate by passing a continuous current through it, the negative pole being thrust into its substance through the rectum. Of the two cures effected, one was produced at the expense of a fistula—not a very agreeable outlook. In cases of organic stricture I gave electrolysis a fair trial, but, failing to get any good results, I do not fancy the treatment in prostatic hypertrophy.

White, of Philadelphia, in 1893, suggested castration. He writes: "It occurred to me some time ago, if the analogy between uterine fibro-myomata and prostatic overgrowth was a real one, castration might have the same effect on the latter that oöphorectomy has upon the former, and cause a shrinkage or atrophy which would result in practical disappearance of the obstruction." The operation is on its trial; so far it seems to have given good results. In one case, however, in which I performed the operation, the patient became melancholic in a few months. After such an experience I naturally give some other method the preference. Ligaturing the internal iliac arteries, as suggested by Biers, was performed for enlarged prostate by Meyer in 1894. "The operative technique was however unfavorable, being productive of recurrent hemorrhages from the left iliac, necessitating religature and amputation of the foot for gangrene."

There are however a large number of old and debilitated patients who cannot with any prospect of success submit to either prostatectomy or castration, and to whom the idea of carrying a urinal on the person is hardly less dreadful than death. As in the operation of ovariotomy, so in that of castration, melancholia will follow in a small percentage of cases, and prostatectomy is sometimes attended with alarming hemorrhage; occasionally the operation is rendered futile by various forms of sub-urethral prostatic growths—a complication which demands special operative measures for its relief. Incision of the vas deferens is as yet on its trial, and until we get more information on the results obtained by the operation we cannot form an opinion on its value.

The sufferers are happily not without the means of relief; for them there is an ideal operation, easy of performance, and practically free from risk—I refer to the formation of an anterior artificial urethra as was devised, and the operation performed, by our distinguished ex-President, Dr. Hunter McGuire, which operation, in May last, I performed on a poor house painter named Reilly, suffering from prostatic retention of urine, who came under my care in the Whitworth Hospital, Drumcondra. For years he had been suffering from dysuria, and from time to time he had complete retention, which a local medical practitioner relieved by passing a catheter. Latterly the passing of the instrument became very difficult, and finally, his attendant having failed to pass the catheter, the man came under my care. He was in intense agony, and through the thin abdominal walls the outline of the bladder—which reached as high as the umbilicus—

could be easily made out. He was aspirated, and 65 ounces of urine drawn off.

For the following four days he was aspirated night and morning, and put on an acid quinine mixture, and saccharine was substituted for sugar in his food. Thoroughly weary of the life he was leading, he asked me to do something to relieve him from these attacks of retention. I told him that it was possible to get free of them, and he consented to an operation. Having thoroughly cleansed the part, and following Dr. McGuire's directions, as published in the Transactions of the American Surgical Association, I began my incision three inches above the upper border of the symphysis pubis, cutting vertically down to the bone and laying bare the linea alba. My next incision, passing through the linea alba, was three-quarters of an inch shorter than the cutaneous one, the shortening being made at the expense of the upper end of the wound. Still keeping in the median line, I separated the tissues with the handle of the scalpel until I came on the transversalis fascia, which I divided. The bladder now bulged into the wound and was secured by two long-handled tenacula, and slit for almost an inch between them. My finger followed the knife very quickly, for there was no bag in the rectum and the walls of the bladder were as thin as tissue paper, the tenacula coming through them when the slightest traction was made. About twenty ounces of urine flowed out. A soft-gum catheter was now introduced, and I sewed up the cutaneous tissues with three deep and three superficial catgut ligatures, leaving an opening at the highest point of the wound of half an inch in length. The following day I removed the catheter and placed a large pad of absorbent cotton over the wound.

For nearly a month the urine dribbled through the superior opening of the wound, and the patient began to think that his last state was worse than his first. Gradually, however, he began to gain control over his bladder, and now (November 1st), almost six months after operation, he is pursuing his work daily, finding no inconvenience from the wound, which he keeps stopped with a little plug of cotton wadding. He is able to retain his urine for four or five hours during the day, and has not once to rise during the night. He expels the stream of urine some feet from his body and is free from any urinous smell. Since the operation he has gained in flesh, eats well, sleeps soundly, and is very happy in the consciousness that the agony of retention cannot occur to him again.

From the digital examination of the bladder I found the prostate to project almost to the posterior wall of the viscus in a saucer-like body, concave on its superior surface from side to side and from before backward; its under surface was convex and fitted like a little lid over a vesical fossa. On raising up the enlarged prostate I found it could be readily applied to the anterior wall of the bladder, and closed the urethral orifice as a cap.

Without one unpleasant symptom the case made a good recovery, and he left the hospital six weeks after admission.

The points of interest in the case were the peculiar shape of the prostatic hypertrophy, its flexibility—almost rubber-like—and the extreme thinness of the walls of the viscus.

The operation is, I think, the first of its kind done in the three kingdoms; and certainly for facility, ease, and effectiveness it is superior to any known to me. No blood is lost, all the incisions being through extravascular tissues; the risk to the peritoneum is more imaginary than real, for if the membrane is met it can readily be avoided; it is quickly performed, and is unaccompanied by shock.

As this was the first case of McGuire's operation done abroad, and as it has been highly approved by many distinguished surgeons who either were present or examined the patient since the operation, I thought it would not prove unacceptable to the Southern Surgical and Gynecological Association. To me it appears more generally useful than any other urinary vesical operation I know of, and it has the enormous advantage of being capable of performance on the very old, very feeble, and the very nervous—a great advance in surgery, worthy of the home of McDowell and Marion Sims.

CASE OF FOREIGN BODY IN THE LARYNX: DEATH FROM SUFFOCATION.[1]

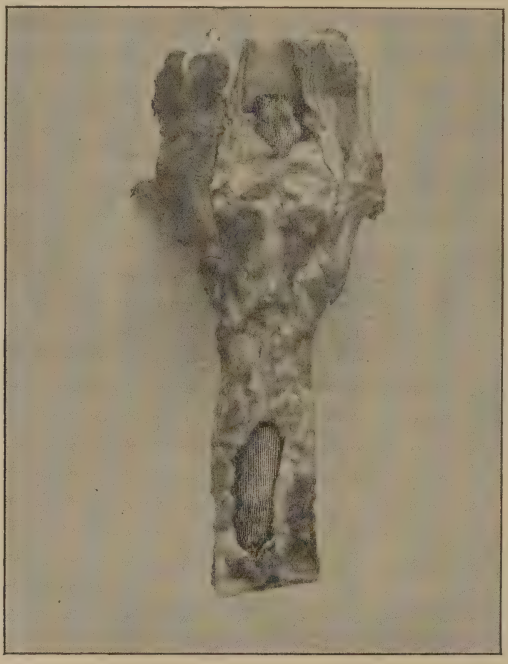
BY GUY HINSDALE, M.D.,
Philadelphia.

THE accompanying photograph is from a specimen removed from the body of a child, a boy aged four years and nine months. It was a case of sudden and unaccountable death which had been reported to the Coroner, and it is owing to the courtesy of his Senior Physician that I was asked to assist at the autopsy and am able to present this specimen. We had no clue to the cause of death except a memorandum suggesting that it might be a case of heart disease. We examined all the organs as well as the brain, and finally explored the throat and larynx and on removing the latter we discovered a pencil two and a-quarter inches (55 mm.) long firmly fixed in the larynx and extending downward into the trachea. The blunt point of the pencil is uppermost and is just visible above the vocal cords; the calibre of the wind-pipe is completely filled by the pencil which has a diameter of 7 mm.

It appeared on further inquiry that the boy had been playing near the

[1] Specimen shown at the meeting of the College of Physicians of Philadelphia, November 4, 1896.

doorway out of his mother's sight some ten or fifteen minutes when a passer by noticing the child lying on the step, carried him into the house apparently dead; but, as I am now told, they noticed that his heart was still beating; he was blue in the face and the hands were blue. The child



Pencil in the Larynx.

was driven to the nearest hospital, where he was examined to see whether or not his neck was broken. The child probably died just after reaching the hospital. There had been no movements of the body, and probably no respiratory sounds that directed attention to the throat, although the skin must have been deeply cyanosed. It was this feature of the case that gave color to the belief that the boy had died of heart disease.

ETIOLOGY AND PATHOLOGY OF ACUTE GENERAL PERITONITIS.

BY HERBERT M. STOWE, M.D.,
Chicago.

ACUTE general peritonitis may be defined as an acute inflammation of the peritoneum associated with a toxemia resulting from the absorption of bacteria or their products. Certain cases of peritonitis are regarded as

idiopathic, either for lack of a better term, or because of our limited knowledge of the disease. If the term idiopathic is meant to indicate a primary disease, not dependent upon another disease or morbid condition, we must exclude as causative factors all co-existing pathological conditions which affect the tissues locally or through the blood-current. In a case of acute intestinal obstruction the serous coat may be perfectly normal, yet in trying to overcome the obstruction by dilatation and engorgement of the blood vessels, the intestine exhausts its strength and falls a victim to the work of the *Bacillus coli communis*. This would be called by some authors a case of idiopathic peritonitis, yet it was evidently caused by the obstruction—a pathological condition.

Three cases of idiopathic peritonitis were recently reported in the London Medical Society. In one there was a history of constipation, with only one stool in every six or seven days. Peritonitis followed exposure in a heavy rain. In the second there was a history of infantile rachitis. This patient had passages every four or five days. The third case was that of an infant of which no history was given. Two of these cases, at least, presented evidence of copremia which, with the rachitis in the second case, undoubtedly availed much in lessening the general tonicity of the system, and to some degree that of the peritoneum. An organ, to be primarily attacked, must be in a healthy state and unburdened by the perversion of one or more functions. In all these cases of so-called idiopathic peritonitis, a careful examination will reveal a deeper current to which all superficial streams are tributary.

The peritoneum, like all other tissues of the body, is subject to two conditions: in the first, the membrane is morphologically and physiologically healthy, but is unable to resist the excessive amount of irritation brought to it. It has been frequently demonstrated that the peritoneum, when intact, can destroy a large amount of septic material, but there is a limit to this power, and when this limit is transgressed, resistance is vain. This is often seen in peritonitis following perforation.

The second condition exists when the vital power of the individual is below normal. There may be a renal insufficiency, a sluggish skin or inactive bowels, whereby the system is continually poisoned with toxic substances. Malnutrition, whether due to chronic tuberculosis, to malignant disease, chronic cardiac and hepatic disease, gout or Bright's disease, certainly aids in reducing to a minimum this power of self-protection and self-preservation. In this depressed state, peritonitis is produced when causes so slight as to escape the notice of the diagnostician are present.

The peritoneum is better protected from sudden thermic changes than the pleura or pericardium, on account of the great amount of blood contained in the mesenteric vessels, especially during the process of digestion. Moreover, the quantities of adipose tissue found in the appendices epiploicæ of the omentum are great storehouses of heat; hence, the greater

rarity of peritonitis following exposure as compared with that due to pleuritis or pericarditis.

The causes of peritonitis may be divided into three groups, as follows:

Infection from the Alimentary Canal.—Perforation and rupture of the stomach and intestines, perforation from biliary calculi, appendicitis, trauma, carcinoma, tuberculous enteritis, dysentery, chronic diarrhœa, acute intestinal obstruction, intestinal parasites and rupture of the sigmoid flexure in the new born during parturition.

Infection from Other Local Sources.—Rupture of abscesses of solid organs, *viz.*, liver, spleen, ovaries, kidneys, and mesenteric glands; rupture of a graafian follicle, specific infection through the tubes, puerperal fever, trauma, extension of an empyema, pneumonia or pericarditis, cysts and infection through the umbilicus in the new born.

Systemic Infection.—Small-pox, intermittent fever, erysipelas, scarlet fever, Bright's disease, septicemia, pyemia, gout, glanders, and anthrax.

During the recent advances in bacteriology, several investigators have endeavored to find a specific micro-organism whose presence in the peritoneum would be pathognomonic of peritonitis. The fields were remarkable for the many varieties of bacteria, both virulent and non-virulent. The most constant of these was the *Bacillus coli communis*, the *Streptococcus pyogenes*, *Staphylococcus pyogenes aureus*, *Pneumococcus*, *Amœba coli* when associated with dysentery, and the tubercle bacillus, have been already identified.

The *Bacillus coli communis* represents a genus of about fifty species normally inhabiting the intestinal canal. It may be found from the mouth to the anus, and as it thrives only in alkaline media, the acid of the stomach largely retards its development. It is also present in the intestines of many of the lower animals. This microbe is non-virulent in the healthy intestine and evidences no migrating tendencies, but when its habitat becomes diseased it suddenly assumes pathogenic properties, burrows through the intestinal walls and invades the peritoneum. Autopsy in perforative peritonitis reveals a general infiltration of the surrounding tissues and dissemination by means of the blood-current. The *Bacillus coli* is identical with the *Bacillus pyogenes fœtidus* and the *Bacillus lactis œrogenes*. It is differentiated from the bacillus of typhoid fever only by delicate chemical and microscopical tests.

In a bacterial examination of thirteen cases of perforative peritonitis recently made by Barbacci, the *Bacillus coli* was the only organism that could be cultivated, except in two cases in which the *Pneumococcus* was found. The colon bacillus was present in the blood in eight out of eleven cases, the remaining three being sterile. Barbacci concludes from these and other investigations that the survival of the *Bacillus coli* is due to the fact that the other germs were destroyed by inflammatory exudate.

The multiple infection in peritonitis was clearly proven by Ch. de Klecki,

who found pathogenic and non-pathogenic bacteria in the tissues, the majority being non-pathogenic. According to this writer, the *Bacillus coli* attained its sudden virulent power by symbiosis with other bacteria before leaving the intestinal canal.

The peritoneum is capable of dealing with moderate amounts of purulent fluid with impunity, provided its structure is normal. This is probably best effected by bathing its surface with an antitoxic serum, which prevents bacterial growth until absorption removes them. When its structure is altered, as by the injection of chemical substances, purulent peritonitis results. Rinne, in his experiments, used croton oil and turpentine invariably with purulent reaction. Waterhouse used material difficult of absorption, as blood, and found that it acted the same as chemicals in that the septic material was kept in contact with the serous surface long enough to produce pathological changes. Halsted placed a sterile potato in the abdomen of a dog without result; he then infected it with the staphylococcus and induced purulent peritonitis.

In 1887, Pawlowski demonstrated that the injection of chemical substances alone, such as croton oil, trypsin, and cold filtrates of pathogenic microbes, produced only a hemorrhagic peritonitis. Very small doses of croton oil produced no symptoms whatever, while larger doses were effective in proportion to the amount used. Trypsin and pancreatin were tried with the same results, trypsin being the more irritant of the two, killing a rabbit in from four to five hours in doses of a half gramme dissolved in sterilized water. The virulent cultures, except in small doses, always produced septic peritonitis. If minute quantities of pus be injected with agar agar or some other nutritive media, the reaction will be similar to that produced by large quantities of infected material. Pawlowski discovered a short, non-motile bacillus which he asserted to be the essential cause of perforative peritonitis and called it the *Bacillus peritonitidus ex-intestinalis cuniculi*. With cultures of this germ he reproduced the disease in dogs. Grawitz claims, however, that this microbe is identical with the *Bacillus coli*.

Peritonitis has been induced experimentally with several germs, noticeably, the *Staphylococcus pyogenes*, *Bacillus peritonitidus* of Pawlowski, *Bacillus coli communis*, the *Pneumococcus* and infusions of putrid meat (Grawitz).

Perforative peritonitis plays a very important part in the discussion of etiology on account of the serious consequences it entails. There is no form of peritonitis, or we might say of abdominal trouble, that the practitioner dreads so much and which demands such prompt attention. Several of the older writers recognized this condition, but supposed it was due to intestinal parasites. Andral, indeed, reports a case where the *Ascaris lumbricoides* was found in the peritoneal cavity, but many of these cases were doubtless due to local causes which passed unnoticed.

The three most common causes of perforation are the round peptic ulcer, the necrosed Peyerian patch, and appendicitis. Evidence of peptic ulcer is frequently found post-mortem, either as a cicatrix or as the ulcer itself—according to Welch in about five per cent. of all cases. Ulceration of the stomach is usually found in young females from the advent of puberty to the twenty-fifth year. In the majority of cases, the ulcer is single, though as many as thirty-four have been found in a single case. The lesion is commonly situated on the posterior wall of the pyloric end and near the lesser curvature of the stomach.

Statistics vary somewhat in this regard. According to Ewald and Nolte, perforation occurred as follows:

Greater curvature	22	cases or	54%.
Pyloric end	13	" "	32 "
Anterior wall	3	" "	7 "
Posterior wall	2	" "	5 "
Cardiac end	1	" "	2 "

Welch records 793 cases of perforation as follows:

Lesser curvature	288 cases.
Posterior wall	233 "
Pylorus	95 "
Anterior wall	96 "
Cardia	50 "
Fundus	29 "
Greater curvature	27 "

On the other hand, Dr. Brinton records a series of 100 cases:

Posterior wall	43 cases.
Lesser curvature	27 "
Pylorus	16 "
Anterior and posterior walls together	6 "
Anterior wall	5 "
Greater curvature	2 "
Cardia	2 "

In this series there were two or more ulcers present in 21% of the cases.

In a series of 463 ulcerations of the stomach, one ulcer was present in 370 cases, two ulcers in 53 cases, three in 16 cases, four in 3 cases, five in 2 and in the remainder there were several.

It is worthy of observation that though few ulcers are found on the anterior wall, the majority of them perforate.

As a rule, a local peritonitis develops in advance of the necrotic process, so that the base of the ulcer may consist of splenic, hepatic or pancreatic tissue. This prevents an opening into the peritoneal cavity. If the anterior wall adhere to the parietal peritoneum an external fistula may form.

In typhoid fever, perforation is prone to occur when diarrhœa and tympanites have been marked. It may occur as early as the seventh or eighth

day, when it is due to the separation of a slough, or as late as the fourth week, when the visceral peritoneum is directly attacked by the ulcerative process. The perforation may be caused by hardened feces, undigested food, straining, tympanites or active peristalsis. The opening is usually small, with clean edges. The slough may or may not be present. If very small, little or no contents escape, and the opening is closed by plastic exudation. When large, the entire contents escape, together with large quantities of gas, and a fatal septic peritonitis is quickly produced. This occurs in about six per cent. of all cases of enteritis. In 1,721 autopsies collected by Murchison, the percentage of deaths was 11.13. Hölscher has 120 cases of perforation in 2,000, or 6 %, while Fitz has a percentage of 6.58 in 4,680 cases. In the Johns Hopkins Hospital, for six years ending May 15, 1895, 13 out of 34 deaths followed perforation (38 %). The percentage of deaths to the whole series of 389 cases of typhoid fever was 3.3. The location of the perforation varies. In the greater number of cases the lesion is found not far from the ileo-cæcal valve, for here the Peyer's patches are most abundant. Fitz found perforations in the ileum in 136 cases (8.14 %), colon 20 cases (12.97 %), vermiform appendix 4 cases (2.59 %), and jejunum 2 cases (1.29 %).

Perforation rarely occurs in ulcerative appendicitis, unless there is a foreign body in the appendix. If the irritation sets up an adhesive peritonitis, the pus is walled off and forms a perityphlitic abscess, which is absorbed or ruptures into a hollow viscus and escapes. If the appendix is long and movable, perforation produces septic peritonitis.

The duodenum may, in a few cases, be necrosed. Severe dermatitis calorica predisposes to ulceration of Brunner's glands. A peculiar feature of duodenal ulcer is that over 80 % occurs in males, while most cases of gastric ulcer occur in young females, a point which should be remembered in diagnosis.

The *Ascaris lumbricoides* may for some unknown reason burrow through the intestinal walls and set up peritonitis. Murray reports three cases in India where this nematode was found in the peritoneal cavity. The perforation in each case was circular and clean cut, the remainder of the bowel being normal.

Normally there is a free and uninterrupted lymphatic circulation in the sub-serous areolar tissues, in which secretion and absorption are equal. As a result the peritoneum is constantly bathed by serum. This serum serves a two-fold purpose: diminution of friction and protection against irritation.

Wälthard exposed a definite portion of the peritoneum of a rabbit to the air for fifteen minutes and injected a certain amount of septic material. Purulent peritonitis was present in a few hours. He then exposed the same amount of peritoneal surface of a second rabbit under a glass globe filled with steam at 40° C. for fifteen minutes, and injected a similar quan-

tity of bacteria. No peritonitis followed. In further experiments, the globe was filled with oxygen, nitrogen, and carbonic acid gas, but without result.

The morbid changes incident to peritonitis are similar to those occurring in serous tissues generally. The interference with the circulation renders the surface unctuous, according to some writers, dry. The characteristic gloss disappears. Sub-serous vessels become injected and form a fine network of hair-like streaks and gives a velvety feeling to the touch. During the first few hours these patches have a bright arterial color, but later change to a dull red. After an interval depending upon the severity of the attack and the resistance of the body, the secretion returns altered in quality and augmented in quantity. The congestion of the blood-vessels produces an edematous condition, and soon the areolar tissues are surcharged with a sero-albuminous fluid, which finds exit through the stomata or cellular interspaces and mixes with the secretion of the endothelial cells. This mixture is very intimate and results in a flocculent precipitation of coagulable lymph or plasma, which settles down and collects in the dependent portions of the abdomen. The proportion of plasma and serum varies greatly. When the peritonitis is caused by chemical agencies, the plasma predominates. The intestines are bound together in a mass by the sticky exudate. Little or no serum is present. This is known as fibrinous or plastic peritonitis. In other cases the reverse holds true, great quantities of straw-green serum are present, and mere traces of plasma are demonstrable floating in the fluid. The fluid may at times resemble that of common hydrocele.

It seems improbable that the grave symptoms so often present in acute peritonitis are due to the inflammation, *per se*, for in cases terminating fatally within twenty-four to forty-eight hours from the onset of symptoms, post-mortem shows only a moderate congestion, a limited effusion, and a few stringy masses of fibrin. In other cases, when suppuration is pronounced and pathological changes are marked, the prognosis is often favorable. When the exudate is purulent, as it frequently is in children, the endothelial cells are directly attacked. The increased irritation causes a karyokinesis of the cells before they are separated from the basement membrane. This rapid division of cells accounts for the great quantities of pus found in the peritoneal cavity. A profuse purulent exudate is seldom absorbed. According to Bristowe, the pus either ulcerates into the intestines or bladder, or forms fistulous tracks along the psoas muscle following the course of an ordinary abscess. In children, the usual point of exit is the umbilicus. Out of 25 cases collected from literature, 15 were in girls, 10 of the 25 cases opened at the navel and 8 of these recovered.

The purulent material is very irritant to the peritoneum. Normal portions become inflamed by mere contact with infected parts, and thus a small quantity of pus may in a short time be disseminated over the entire peritoneal surface.

A very constant, as well as distressing condition in acute peritonitis is tympanites. This is due to fermentation of the intestinal contents. When perforation has occurred, the gas is free in the abdominal cavity and gives rise to an important physical sign—absence of liver-dulness. If perforation has not taken place, the greatly distended intestines push the liver up into the pleural cavity and liver-dulness is higher than normal, but not to any considerable degree decreased in area.

A peculiar fact is to be observed in the early reversal of the biliary current. The function of the pylorus is temporarily interfered with and oft-repeated biliary emesis occurs. After a few hours the intestine below the common bile-duct contains no trace of bile as far as chemical analysis shows. Whether the liver and its ducts are affected by contiguity, or whether this disturbance is due to a general cause is not understood. It is true that the organs are affected to a certain extent by inflammation of their serous coat, and the persistent vomiting may be caused by the direct action of bacteria upon the peripheral twigs of the pneumogastric nerves.

Under favorable conditions the plasma undergoes productive change. Sub-serous capillaries pierce the fibrinous masses in all directions, absorb the contained serum and contract its bulk. This contraction may lead to distortion of certain viscera, notably the intestines and omentum. Organization proceeds rapidly until the new product is identical in function with the old peritoneum, and is liable to renew the same changes. Those portions of the old peritoneum covered by the new product are changed into fibrous or fibro-areolar tissue.

When peristalsis is active during the acute stage of the disease, the deposits are formed into fibrous, or fibro-cartilaginous laminæ of various dimensions. The edges may be well marked, ill defined, or even lobulated. If these bands are small and slender, they will usually disappear by absorption, otherwise they become organized and fuse with the thickened peritoneum of the different abdominal organs. False ligaments of the liver and spleen are frequently found. The uterus and ovaries are bound down. The fimbrinated extremities of the tubes may be occluded, causing sterility. Adhesions to a coil of intestine in a hernia, or to the sac itself, may occur. The omentum is often rolled up into a transverse band. The entire cavity may be obliterated. Peritoneal bands, whether attached at both extremities or only one, are frequent causes of acute intestinal obstruction, but they may lie in the abdomen during the life of the patient without giving rise to any trouble. When a band is tense and unyielding, a coil of intestine may become ensnared underneath it, causing venous engorgement below the constriction and retention of fecal contents above. However, such a condition may occur without actual obstruction and continue for any length of time, provided the direct agencies of obstruction are absent. Should any circumstance arise which alters the position of the parts, such as a fall, a coughing spell or a cathartic, acute obstruction will ensue.

The three following cases recently came under my care:

Case I.—R. C., student in music, *aet.* 21, gave a good family history. This patient presented general typhoid symptoms for several weeks. Though he was obliged to postpone his music lessons, he was not confined to his bed. One evening in company with several friends, he became somewhat intoxicated and partook of immoderate quantities of olives, crackers and cheese, peanuts, and popcorn. About midnight he had a slight chill and complained of pain in his stomach. The pain growing worse, he was taken home. I was called at 1 A. M, and found him suffering severely and vomiting. The stomach contents consisted among other things of twelve olives that had been swallowed entire. Examination showed an enlarged and sensitive abdomen with rigid walls. No tympanites. The spleen could be palpated an inch below the costal margins. The liver was apparently normal. Three typical rose spots were present. The heart was hypertrophied toward the left, the apex beat being located half an inch to the left of the mammary line beneath the sixth rib. A systolic bruit was heard. Twelve hours after the initial symptoms appeared, the abdomen was markedly tympanitic and tender. The liver dulness was greatly diminished in area. The splenic dulness had noticeably altered, as tympanitic resonance was elicited an inch and a-half above the costal arch, a difference of two and one-half inches since the onset. Pressure over the appendix revealed no tenderness beyond the general hyperesthesia. The patient complained of a boring pain at a point two inches below and an inch to the left of the umbilicus. The pain was constant, but was relieved when lying on the left side though aggravated when on the right. All the symptoms, signs and history pointing to perforative peritonitis, surgical interference was urged; but the parents refused to allow an operation until their home physician was present, necessitating a day's delay.

At 5:00 P.M. vomiting returned with increased violence and continued until midnight despite all measures taken to check it. The expulsive efforts were so great that the patient was lifted from the bed. The ejecta contained considerable bile, and later had a putrid odor and dark color. The temperature, which had gradually risen, was now 105.2° F., and caused great restlessness. The pulse was 138 and thready. Respiration was difficult on account of the distension, mainly supracostal in type. A catheter introduced into the rectum afforded some relief, by allowing quantities of gas to escape. As the vomiting ceased, delirium set in, making it necessary to forcibly restrain the patient from getting up.

At 2:30 A.M. profuse perspiration occurred, lasting nearly an hour. The delirium was followed by stupor, the patient being utterly oblivious to his surroundings. The temperature dropped in less than an hour to 97.4° F. The pulse was exceedingly rapid. No radial or tibial pulsation could be felt. The extremities became cold and were covered with a clammy perspiration. Respiration was 14 a minute, and at 4:00 A.M. changed to the Cheyne-Stokes type. The patient sank gradually until the end, which came at 7:15 A.M. No autopsy was made.

The main treatment in this case was the use of opium in sufficient quantity to relieve the pain. When the collapse came stimulants were used. No effort was made to unload the bowels, which were constipated at the time. Surgical interference was the only treatment here indicated. On account of the diseased condition of the intestinal walls and the peculiar nature of the ingesta, as well as the rapidity of the toxemia which resulted, it is more than probable that several perforations were made, allowing considerable septic material to come in contact with the peritoneal surfaces.

Case II.—E. S., mercantile clerk, aet. 43. Family history good. Has suffered from constipation for years. Five years ago, while in the South, was attacked with dysentery and made a very tardy convalescence. Since that time has had several "bilious" attacks accompanied with jaundice. There is no history of biliary calculi. The patient has had sick headache for some time, especially at night, which prevents him from sleeping until after midnight. Specific infection is denied. About two weeks after one of these "bilious" attacks I was called and found the patient lying on his back with the legs drawn up, complaining of abdominal pain and restlessness. The abdominal walls were quite inelastic and tender on pressure. The epigastrium was depressed. Pressure over McBurney's point was negative. The liver was slightly enlarged, the lower border being easily felt below the ribs. The spleen was normal. No evidence of portal congestion was present, except two large hemorrhoids. The tongue was coated with a brownish fur, the breath bad. The temperature was 102.4° F.; pulse, 108; respiration, 20. During the night the patient had several attacks of vomiting.

The next morning the patient was greatly relieved, also the vomiting. The thermometer registered 100.4° F.; pulse, 98; respiration, 20. Examination of the heart and lungs was negative. Some tympanites present. Teaspoonful doses of magnesium sulphate were ordered every hour until free catharsis was produced. Diet was limited to hot milk.

At 9 P. M. the bowels had acted but feebly. The pain was worse than on the preceding night. Vomiting had returned; nearly pure bile was ejected. The temperature was 103.8° F.; pulse, 129; and respiration, 26. The abdomen was hard and very sensitive. The opium pill was given every hour and turpentine stupes were applied to the epigastrium.

Third day. Evening. Pain not relieved. Tympanites. Patient is able to keep nothing on his stomach. Complains of headache. Opium pill given every half hour. *Urinalysis.*—Sp. Gr., 1026; distinctly acid reaction, smoky color, indican, traces of albumen. Temperature, 102°; pulse, 116; respiration, 24.

Fourth day. Evening. Fluid is present in the pelvis, as determined by dulness on percussion. Tympanites not marked; cutaneous hyperesthesia present. Pain lessened. Any attempt to take food causes emesis. Pellets of ice dissolved in the mouth alleviate the thirst. Micturition is painful. Temperature, 102.2° F.; pulse, 120; respiration, 22.

Fifth day. Evening. Tympanites much relieved by turpentine stupes. On account of the increasing exudation the pain is moderate. An enema of white Castile soap and warm water produced very beneficial results. Temperature, 100.2° F.; pulse, 106, weak; respiration, 20.

Seventh day. Evening. Condition improved. The patient is able to retain small quantities of peptonized milk and brandy. The abdomen contains fluid; the walls are less resistant. Patient had two good bowel motions. Temperature, 100.2° F.; pulse, 96; respiration, 18.

From this time on the patient made a steady convalescence. On the fourteenth day increasing doses of the saturated solution of potassium iodide were given, and resulted in a rapid absorption of the exudate, and by the twenty-sixth day no evidence of its presence was found.

Two weeks thereafter he returned to his work. The patient is now taking sodium phosphate and strychnine sulphate for his constipation, and when I last heard of him he was feeling considerably better.

Case III.—L. B., merchant, aet, 54. Family history of rheumatism. This patient has suffered from chronic gastritis since the late war. Five years ago,

while living in a swampy district, was a victim of malarial infection. Last March he failed in business, and this with worry, overwork, and loss of sleep reduced him to almost a wreck. He went into the country and rested for some months and was benefited, but still suffered from insomnia and loss of appetite. Early last November, while out in a cold rain, he got wet and neglected for some hours after to change his clothes. Despite the precautions taken upon his arrival at home, in the form of a hot bath and a ten-grain Dover's powder, he was seized in the early morning with pain in the abdomen and vomiting.

The pain was general and no particularly sensitive spots were found. The parietes were quite resistent to pressure, giving one a sensation of a bladder of new putty. The pain was increased when the legs were parallel with the body. The amount of gastric contents expelled led me to suspect gastrectasis, which condition I found on examination, the greater curvature reaching to two inches below the umbilicus. The spleen was somewhat enlarged; liver normal. The tongue was large, flabby and coated with a white fur. Considerable pyrosis was present. The temperature was 102° F.; pulse, 108 and weak, intermitting every seventh beat. Heart sounds normal. Bowels constipated. In this case, I gave drachm doses of magnesium sulphate every hour; but four attempts resulted in immediate expulsion. Substituting calomel in grain doses every hour succeeded in moving the bowels in a short time. The stomach now tolerated several doses of the saline, which had a most salutary effect. The increased pain due to peristalsis was relieved by a sixth of a grain of morphine. The next morning the patient had improved in every way, the pain was absent, he could straighten his legs without fear, the temperature was nearly normal, there was no vomiting, and the patient retained a glass of hot milk. The saline was repeated during the morning and secured four passages, the last two of which were nearly serous. The evening temperature was normal, the abdominal tenderness was very slight and the patient felt well in every way. A fluid diet was prescribed for a week. I saw this patient about two weeks ago and he reported that he was improving rapidly, was able to sleep well, had a good appetite, and had felt no pain in the abdomen since the attack.

CLINICAL LECTURE.

ORGANIC NERVOUS DISEASES AS NEURONIC DISEASES.[1]

BY WM. G. SPILLER, M.D.,

Associate in Clinical Medicine, Wm. Pepper Clinical Laboratory, University of Pennsylvania: Pathologist to the Pennsylvania Training School for Feeble-Minded Children.

THE subject of organic nervous diseases upon which I have been invited to speak to you this evening can hardly be called a narrow one. It is true that there are many nervous diseases which we are still obliged to class under the indefinite name of functional, but our knowledge of the various maladies is ever growing, and we may hope that one by one all the morbid processes will reveal to us their organic basis. The day may yet come when chorea, or St. Vitus' dance, when hysteria, when the various forms of insanity, and that exceedingly common affection which we call neurasthenia or nerve exhaustion will open to us their hidden nature, and we will understand them in the way we now understand hemiplegia, tabes dorsalis, disseminated sclerosis, etc. And yet these oft-studied forms universally recognized as organic, have many secrets to reveal to us. Numerous papers published in all civilized languages every year dealing with even the best known of organic diseases are witnesses of the correctness of this statement.

When we consider what an important part the nervous system plays in all forms of disease, we may well be at a loss to know where to draw the dividing line between organic nervous diseases and those not generally recognized as such. Scarlet fever, typhoid fever, and many others affect the nervous system and give rise in this way to some of their most serious symptoms. Every muscle, every gland in the body is controlled by nerves,

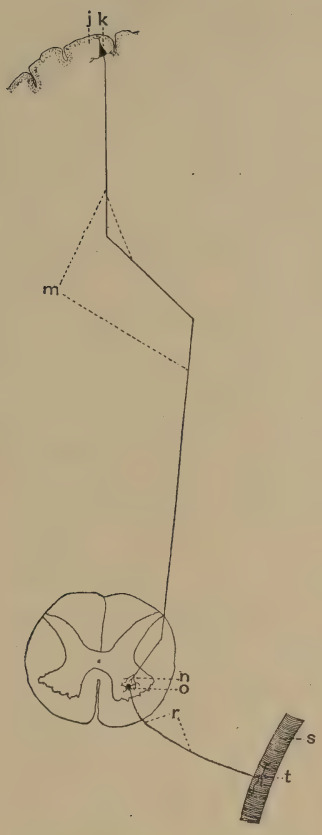
[1] I have adopted the spelling of the word neurone authorized by Prof. Gildersleeve. *Bulletin of the Johns Hopkins Hospital*, November-December, p. 201, 1896.

and can only discharge its functions so long as the nervous system is in a normal state. But we have accepted tacitly a certain group of diseases affecting chiefly motion and sensation which we recognize as organic nervous diseases. Let me, first of all, tell you what is usually meant by the words organic and functional. We see some sign of disease; we examine the organ which has given rise to this, and if we find a condition which is not present in health, and is important enough in our opinion to produce this sign of disease we say it is an organic sign, if we find nothing we call it functional. Thus we say neurasthenia is a functional disease, and when we hear of death in severe cases of neurasthenia, nerve exhaustion—for death may occur in neurasthenia—we shake our heads and wonder if after all there is not some real organic change behind such serious manifestations.

With such a field to choose from as my subject suggests I am at a loss to know where to begin. It seems best to touch lightly on the anatomy of the nervous system, for only when you have a few facts clearly fixed in your minds can you hope to understand this rather difficult branch of medicine. You are well aware that the chief mass of nervous tissue constitutes the brain, which is located within the skull. From the lower part of this a band of nervous matter, not thicker than your first finger, passes down the back within that bony structure which we commonly call the backbone, or spinal column. Bear in mind the size of this bundle of nerve fibres, which is not thicker than your first finger, and you may perhaps be surprised that by means of this every voluntary movement of the limbs is made possible, and that when this is destroyed paralysis at once develops. Think how the nerve fibres are crowded into this narrow compass. From the base of the brain and from the spinal cord nerve fibres pass out to the surface of the body and convey the impulses sent from the brain to the muscles of the body, and the sensory impulses originated within the skin to the brain. This constitutes the nervous system—brain, spinal cord, and peripheral nerves.

I am going to ask you to accept a term perhaps new to you, but if you will do so I think you will be better able to understand many nervous diseases. All organic nervous diseases affect primarily either the neurones or the supporting tissue which holds these together. It is necessary before going further to get a clear idea of the meaning of this word neurone. By this we mean a nerve-cell with its processes, especially with its chief process which is called the axis cylinder and the end terminations of this. This is an unit, injury to one part of this structure involves the whole. The nervous system is made up of these neurones, and some of them are exceedingly long. It is surprising that a structure so delicate as one of these and which is seen only in part with the microscope, should extend from the lower part of the spinal cord to the end of the foot, or from the surface of the brain to the lower part of the cord (see Fig. 1). There are

FIG. 1.



The central and peripheral neurones; j, motor cortex; k, motor cell; m, central motor neurone; n, termination of central motor neurone about a motor cell of the spinal cord; o, motor cell of the spinal cord; r, peripheral motor neurone; s, muscle fibre; t, termination of the peripheral motor neurone within a muscle fibre. (Modified from Edinger.)

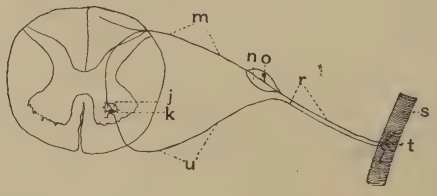
sensory and motor neurones. Close to the spinal cord we have on either side a row of small bodies called spinal ganglia. Every sensory root of the spinal cord is in connection with one of these ganglia. Within these ganglia are cells which have a sensory function. From each one of these cells a process passes toward the surface of the body to gather up the sensory impressions produced upon the surface. These are carried to the cell within the spinal ganglion and are sent by means of another process from this same cell into the spinal cord and brain.

Let us study the motor neurones. They are of more interest simply because we know more about them. At a certain part of the brain surface in the area known to be motor by various experiments and by study of disease processes, are situated many of these cells which form the bodies of the neurones. From these a delicate nerve process, well protected by an insulating sheath, passes through the hemisphere of the brain, and crosses to the other side in the upper part of the spinal cord in the portion called the oblongata, and then passes still further downward and terminates finally in numerous ramifications. Think of the long course such delicate fibres must follow, and remember that many of the symptoms of nervous diseases are due to a break in these somewhere, and you will realize why nervous diseases such as hemiplegia, or paralysis of one side of the body, are so common. From the point of termination of one of these central neurones about a cell within the spinal cord, a second neurone passes to the muscles, even to the most distant part of the limb. Surely this little amount of anatomy is easy to grasp, and if you will accept this you will understand the disease processes much better. There are but two sets of neurones in the motor system, one of these neurones passes from the surface or cortex of the brain to a nerve-cell within the cord; from here a new unit, another neurone, passes to the surface of the body. Of what use now is this knowledge? A motor impulse originates, we will say, within one of these cells at the surface of the brain. If the central neurone is perfect this impulse

can pass downward to the extreme end of the neurone, and there is received by the second neurone, which in turn, if perfect, can convey it to the muscle, and the motion intended, such as raising the limb, is performed. But suppose we have an interruption somewhere in this central neurone, what happens then? The impulse is checked and can not pass downward and the part below is paralyzed. If the interruption is in the peripheral neurone, *i. e.*, within the portion which extends from the spinal cord to the surface of the body, you will perceive that the motor impulse must again be cut off from the parts below and the limb is paralyzed. Perhaps you will ask if paralysis occurs in either case what is the use of this neurone theory. As a rule only the part below the break in the neurone is much degenerated; there is also some degeneration in the central portion still attached to the cell body, but the great degeneration occurs in that part which has been cut off from the cell body. Again it is doubtful if this degeneration of the distal end of the central neurone passes over to the peripheral neurone, so that when the central neurone is injured we have some means of ascertaining this fact and of locating to a certain degree the process. Let us apply this principle to some of the well known forms of disease of the nervous system.

But first we must tell you that some movements occur independently of the brain. In the diagram (Fig. 2) you see a sensory nerve-fibre passing into the cord and terminating about a cell which receives the impulse sent to it and converts it into a motor impulse. This now passes from the cell through its fibre to a distant muscle. These involuntary

FIG. 2.



The peripheral sensory and motor neurones; *j*, termination of the peripheral sensory neurone about a motor cell of the spinal cord; *k*, motor cell of the spinal cord; *u*, peripheral motor neurone, *m*, sensory neurone, *n*, spinal ganglion on the sensory neurone; *o*, cell of the spinal ganglion sending one process, *m*, to the spinal cord and one process, *r*, to a muscle fibre; *r*, nerve formed by the union of sensory and motor neurones; *s*, muscle fibre; *t*, termination of sensory and motor neurones within a muscle fibre.

movements we call reflexes, and the best example of a reflex is the knee-jerk, though this is not accepted as a true reflex by all. You have no doubt often seen the physicians strike the tendon of a patient just below the knee in order to see if the foot moves outward as a result of the blow. We know that when this movement is present the sensory fibres passing upward from the muscles about the knee to the spinal cord, and the motor fibres passing from the spinal cord back to these muscles are

intact. If either of these sets of fibres were injured at any part, the knee-jerk would be absent. We know that the arc which is made by these fibres, from the surface of the body to the spinal cord and back again to the surface, passes through the lumbar part of the cord, in that part which is called the small of the back. Destruction of the fibres in the spinal cord above this lumbar region does not destroy the knee-jerk, but, except in rare cases, increases it. You will see, therefore, that the presence or absence of the knee-jerk is a valuable sign in locating disease.

You must bear in mind that a sensory impulse actually travels in some unknown way up a nerve fibre into the spinal cord, and from the spinal cord into the brain. If you prick your finger with a pin it causes pain and you feel the pain in the finger where the prick has really occurred, at least you think you do, but in reality you do not. You feel the prick in your brain and simply from being accustomed to associate always the surface of the body with sensation, you think the pain is in the finger. If you were to cut off your arm at the shoulder do you suppose you would get rid of all pain in the arm? Not at all, you would still have pain, and would probably locate it in the hand which you had lost. Ignorance of this fact has led to amputation of a limb on account of severe pain or tremor, and the patient has suffered as much or even more after the amputation. The pain is not caused of course in the hand after the limb has been removed, but in the stump which is left. The brain cannot learn to readjust itself to the loss of the limb, for as I have just said sensation is probably felt in the brain. We know that a sensory impulse travels up a nerve into the spinal cord and then into the brain, because if a nerve is cut we cannot produce any sensation by irritating the skin to which the nerve is distributed, and if the spinal cord is cut, there is no sensation possible in any part of the body below the point of section. If we irritate the central part of a nerve above the point where it is cut, we produce sensation which may be located in the extremity of the limb. But let us return to the application of the neurone theory to organic nervous diseases.

How very often we see a man as he walks either swinging or dragging one leg, and if we examine his arm on the same side we see that it is flexed and rigid, and that he is unable to make any use of it. We say at once this is one-sided paralysis, or to use the common term, hemiplegia. Now, where is the location of the disease process which has caused this? If you strike lightly just below the knee, you will observe that the knee-jerk is much exaggerated. That is sufficient for a partial diagnosis. You may say the peripheral neurones are not destroyed. In order to obtain a knee-jerk it is necessary to have intact a sensory neurone—we will speak of one merely for clearness—passing to the cord, by means of which a sensory impulse can travel upward to the motor cells of the cord and can pass out from the spinal cord as a motor impulse to the muscles. If this reflex arc is destroyed, there can be no knee-jerk. If we wish to

be still more sure that the motor and sensory peripheral neurones are intact, we may try the electrical reactions of the muscles of the limb. If the motor neurone is normal, these reactions will not be altered. You will see the neurone theory has great value. But we must locate more definitely the disease process in the central neurone, for we have seen that this neurone has a very long course. The paralysis is unilateral, only one arm and one leg are much involved; therefore we can be pretty sure that in most cases the injury cannot be within the cord, for the spinal cord is so narrow that it is unusual to have an injury of only one-half. We can usually say that the damage to the nervous tissue must be within the cerebral hemisphere, for a lesion below this portion is usually associated with paralysis of the muscles supplied by some of the cranial nerves. In most cases this hemiplegia is due to hemorrhage or plugging of an artery within or upon the brain.

Let us apply the neurone theory to another disease. A child is brought to the hospital with paralysis of one limb, we examine the part and find that it is very small, and the mother tells us that it has never developed like the other limb. We search for the patellar reflex and get no response. We examine the part with the electrical current and find the reactions are altered. The mother tells us that the child was not born in this condition, but that up to a certain age the leg was well developed and that the child walked as other children. Early in childhood there was an acute febrile disease with convulsions. Where is the lesion? Could it be in the central neurones? Hardly, for then the knee-jerk would be present, the electrical reactions would not be altered, and there would probably not be as much atrophy, at least not in most cases. The injury must be in the peripheral neurones. Could this be a neuritis? No, for there has been little or no pain and no disturbance of sensation and no tender points along the line of the nerves. The lesion must be where sensory and motor fibres are not united, and we locate the process in the motor cells of the cord, and experience has shown the correctness of this diagnosis in many cases. We call this spinal infantile paralysis.

Another patient enters the hospital walking with great difficulty. He tells us he has difficulty in moving one leg, and he complains of great pain in this limb. When we bend the limb at the hip-joint, without flexing the leg at the knee, in order to put the nerve on the stretch, the man cries out with agony. We press certain parts where we know the nerve lies near the surface and the patient winces from pain. We can not obtain a knee-jerk, and the electrical reactions are probably altered. Where is the lesion in this case? Within the central neurones? Assuredly not, for the pain is great, the knee-jerk is lost, the electrical reactions are altered. The central neurones are probably intact. Can it be in the motor nerve cells as in the preceding case? Not entirely at all events, for, while these cells are perhaps involved, the pains and the tender points on pressure show

that the peripheral sensory neurones are also affected. The portion where sensory and motor fibres lie near together must be affected, and we call the process inflammation of a nerve, or neuritis.

Let us look at another patient who has a common disease and one of the sensory neurones this time. The man enters the room staggering from side to side. You ask him to stand erect and you find he can do so only with great difficulty. He closes the eyes at your request and if you are not on your guard he falls to the floor. He has no knee-jerk. He complains of sharp, shooting pains. You find that his pupils do not become smaller when exposed to strong light, although they do when the patient regards an object near at hand. You have sufficient evidence, you need not investigate further in order to make a diagnosis. You say the man has tabes, or locomotor ataxia. Can we explain any of these symptoms? The sharp, shooting pains are probably due to irritation of the sensory fibres where they enter the posterior portion of the spinal cord, and later in the disease to irritation of the sensory fibres of the peripheral nerves. The ataxia is probably due to the same cause. The sensory impulses coming from the periphery of the body are no longer conveyed in a normal manner, and as a result the cells controlling the various muscles do not receive the same impulses as under normal circumstances, and the perfect harmony of movement is impossible, and we have ataxia. The knee-jerk is absent because the sensory part of the reflex arc is impaired, and the impulse can not pass to the motor cells. The man is not paralyzed for the motor neurones are not injured. He falls when his eyes are closed because he no longer knows his relation to surrounding objects, and has no impulses passing up over the sensory nerves to tell him the position in which he is standing. He can no longer normally feel the floor beneath his feet, and he loses himself in space and falls like a log. Each one of us knows when his eyes are closed the position in which he is, but the tabetic patient has a very imperfect knowledge of the state of contraction of his muscles, and of the position of his joints, and can only locate his limbs when he sees them.

You may apply this idea of the neurone much further, but I have given sufficient examples to show that organic nervous diseases may be called neuronic diseases. There are others, however, which involve primarily the supporting tissue of the nervous elments and the surrounding membranes of the cord, and yet the symptoms are only produced when the nervous tissue proper is affected.

Frequently we see a patient who staggers like a person with tabes. He has a tremor in his hands which increases greatly when he attempts movement. He tells us he has seen double. His knee-jerks are much exaggerated. He has never complained of much pain, and although he is not paralyzed he is distinctly weak. Can we tell the nature of his malady and the location?

This disease we called disseminated sclerosis. What is the explana-

tion? First of all we know the peripheral sensory and motor neurones must be intact, or the man would have pain and would probably have absence of knee-jerk. We can say the process is in the spinal cord or brain, and usually it is in both. We feel quite certain that the cord is affected, for the trouble is bilateral, though, of course, there might be lesions in the cerebral hemispheres. The tremor is in both hands, and the knee-jerks are both increased, but one may be more exaggerated than the other if more of one side of the cord is affected. This is a disease which probably begins in the supporting tissue of the cord or brain. The insulating sheath of the central neurones is destroyed and some of the neurones are cut, but not all. In the midst of the thickened tissue nerve fibres may still be found. It is possible that the tremor we have noticed is the result of the destruction of the insulating sheaths, or of weakness. Just as in a telegraph wire the electric current passes from the wire if it is not properly insulated, so in the spinal cord the nerve current is probably scattered when the protecting sheath of the nerve fibres is destroyed. Instead of a motor impulse travelling down the nerve fibres and passing to the proper muscles, it affects an unusual number of fibres, and as a result we have an imperfect movement of the limb, an untimely contraction of certain muscular fibres and extension of others. The weakness is the result of destruction of certain of the central motor neurones. The staggering gait is possibly the result of injury to the sensory neurones within the cord, because the patient does not know perfectly the position of his limbs. Possibly the motor neurones may also have a part in the production of this peculiar gait, as the motor impulses do not travel down the fibres in a normal manner.

In some cases we have inflammation of the cord and its enveloping membranes, but the symptoms are produced by injury to the motor and sensory neurones.

Another disease which begins in the supporting tissue is known by the name of syringomyelia. The symptoms are due to acavity within the cord which has either existed from the early development of the cord, or which has been formed by destruction of nervous tissue or of a tumor within the cord. It is a peculiar fact that in this disease sensation is not equally affected for all forms. The patient can usually tell correctly where he is touched, but if you prick him with a pin it causes little or no pain, and he is not able to distinguish heat or cold. The only benefit, with which I am familiar, ever experienced by any one from this malady, was by a patient of Frankl Hochwart, who was unable to feel cold, and was able to save the expense of a winter overcoat. It is probable that the fibres for pain, heat and cold have a more central course within the spinal cord, and that they are affected when the fibres for touch are uninjured. The lesion is usually situated in the middle or upper regions of the spinal cord. As the motor cells are often affected, we find symptoms due to involvement of these

parts, such as atrophy and loss of power. As the central motor neurones are in some cases injured, or at least pressed upon, by the new growth, there may be weakness in the legs, and the knee-jerks are usually increased.

I am well aware that I have presented you only a brief sketch of organic nervous diseases, and have avoided many interesting points which are incapable of explanation. I have merely attempted to give you a few of the elementary principles which the physician uses in making a diagnosis of any nervous disease. The theory of insulation as applied to the medullary sheaths, I must also tell you, is at present nothing more than a plausible theory.

REVIEW OF MEDICINE.

MEDICINE.

The Origin of Icterus in Pneumonia. (*Centralbl. für Bakt., Parasit., und Infectionskr*, December, 1896.) By Dr. G. Banti, of Florence.

The urine of patients presenting icterus in the course of pneumonia usually contains no bile pigment, although urobilin is present in considerable quantities. This fact, together with the results of some experiments upon lower animals in which the *Pneumococcus* had exerted a destructive action upon the red blood-cells, led Banti to suspect that the jaundice was hematogenetic rather than hepatogenetic in origin. The wide distribution of the *Pneumococcus* throughout the organism renders such an action very possible. Recently he had the opportunity of studying 15 cases of pneumonia in which icterus occurred. All these cases were severe, more than half dying, and in all bilirubin was found in the urine, only disappearing after complete recovery. In most cases where autopsy was obtained microscopical investigations of the liver showed that there was no catarrhal condition of the bile-ducts; in other words, there was no obstruction to the outflow of the bile; neither were there in the liver cells any changes that explained the development of an icterus, although the ordinary parenchymatous degeneration, found in fevers, was observed in some parts. In the spleen the usual signs of hemolysis were observed. The cultures from the sputa and organs showed in all cases the presence only of the *Diplococcus lanceolatus capsulatus*. This organism colored well by Gram's method; did not grow upon gelatine; grew upon agar and blood serum at blood temperature; was pathogenic for rabbits and mice, producing rapid death from septicemia. An interesting fact, however, observed after the rabbits had been injected, was that the urine contained considerable

quantities of hemoglobin, but in no case any trace of red cells. The excretion of hemoglobin usually commenced about 10 or 15 hours after inoculation. When the animals were examined after death numerous subserous hemorrhages were found, besides the other symptoms of septicemia. Similar results were obtained after inoculations were made from the blood of rabbits that had been killed by pure cultures. If, however, the series was continued, the hemoglobinuria became less and finally disappeared after from three to six re-inoculations. In the rabbits that died without hemoglobinuria the histological lesions were those ordinarily produced by the *Diplococcus*. Curiously enough the absence of the power to produce hemoglobinuria did not seem to diminish the virulence of the organism. The organism was also pathogenic for dogs, causing death in 2 or 3 days. The urine contained hemoglobin, urobilin, and bilirubin, but in no case were there any signs of icterus. If another dog was injected with the blood of the first, neither hemoglobin nor bilirubin appeared in the urine. Banti concludes from these experiments that under certain circumstances the *Diplococcus* must possess a powerful hemolytic action and that the *icterus pneumonicus* is an infectious form of jaundice. Usually this action is slight, serving merely to produce an increase of the bilirubin and its reabsorption; but under rare conditions it is strong enough to produce an actual pleochromic icterus.

SAILER.

Primary Sarcoma of the Tail of the Pancreas. (*The Journal of the American Medical Association*, December 12, 1896.) By Fred. J. E. Ehrmann, M.D., of Chicago.

The author reports a case of small round-celled sarcoma of the tail of the pancreas with secondary tumors in the liver. The pancreatic growth could be felt during life as a firm, tender mass, not moving with respiration, beneath the edge of a nodular liver. There was a moderate rise of temperature during the progress of the case; but just before death the thermometer showed a subnormal registration. The urine did not contain sugar. Secondary growths, identical in structure with the primary tumor in the pancreas, were observed on the visceral layer of both pleuræ and in the liver. Microscopic examination showed the pancreatic tumor to be composed of small round cells without definite arrangement. There were large vascular channels and areas of hemorrhage throughout the growth.

JOHN M. SWAN.

On the Cirrhotic Liver. (*Birmingham Medical Review*, October, 1896.) By H. D. Rolleston, M.D., Cantab., F.R.C.P., London, and W. J. Fenton, M.B.

In an exhaustive paper based upon the post-mortem records of 114

cases from St. George's Hospital, London, during the past ten years, the authors present some very interesting data concerning the cirrhotic liver. Doubtful cases have been excluded from the list. Of the 114 cases, 47 were fatal from the effects of cirrhosis, while in the remaining 67 death was due to other causes. Of these 67, 17, or 25 % died from tuberculosis. The high ratio is probably due to alcohol. In only 3 cases was death due to peripheral neuritis of alcoholic origin. Mention is made of the fact that in 14 fatal cases of alcoholic neuritis under the observation of Dr. Kerr the liver showed macroscopic evidence of cirrhosis in 3, or 21 %. Of the 114 cases, 82 were male, 32 females—all adults. Taking all the cases the relation of males to females was 5 to 2. The conclusion is drawn that while cirrhosis is commoner in males, it is also more often latent in females. The average for all cases of cirrhosis is 48.1 years. The average for males is 48.88 years, for females 46.2 years. Little difference has been observed between the ages of patients dying from cirrhosis and those dying from other diseases, but with cirrhosed livers. What difference there is (1 year and 4 months) is in favor of cirrhotic cases. The average age of cases fatal from alcoholic cirrhosis was 46.6 years: that of non-alcoholic livers was 49.9 years. The average weight of all the alcoholic cirrhotic livers was 65.59 ounces, that of the non-alcoholic livers 58.6 ounces. Among the conclusions drawn by the authors from the data given in this paper are the following: that in fatal cases of cirrhosis a large liver is found more frequently early in life; as age advances the weight diminishes; that the average weight of the liver in fatal cases of cirrhosis is considerably increased, the average being 63 ounces. 80 % of the cases are alcoholic, the weight in those cases being 67.7 ounces. The liver of fatal alcoholic cirrhosis is considerably larger, that of fatal non-alcoholic cases is smaller than natural (*i. e.*, 41.1 oz.). Among female patients a large liver, with head symptoms and little or no ascites, is more frequent early in life, while later in life a small liver and ascites are more common. Ascites appears to be commoner in males. In both sexes the decade between 50 and 60 years is the most fatal from cirrhosis. The weight of the spleen though increased above the normal, does not bear any constant relation to that of the liver in fatal cirrhosis. There is a high rate of mortality from tuberculosis in cases of cirrhosis, and in fatal cases pulmonary tubercles are found in 21.2 %. In latent cirrhosis, death occurring from other causes, pulmonary tubercle was less frequent, being present in only 14 %. Cirrhosis is found to be fatal to females earlier in life than in males. Alcoholic cirrhosis is fatal earlier than non-alcoholic cirrhosis. When cirrhosis is latent the weight of the liver diminishes with age. Malt liquors and spirits both give rise to enlarged cirrhotic livers. Fatty change occurs equally in large and in small cirrhotic livers. In cases fatal from cirrhosis, the liver weighs less than normal in only 23 %. The paper is supplemented by a detailed table of cases which summarizes

and confirms the statements made. The paper is certainly valuable, because an exhaustive presentment of the phenomena of the cirrhotic liver.

CATTELL.

Two Cases of Sarcomatosis with Purpura Hemorrhagica. (*Jour. Exper. Med.*, November, 1896.) By C. F. Martin, M. D., and W. F. Hamilton, M. D.

The first patient had a history of having lost flesh for two months prior to admission; later she had complained of anorexia and pain in the epigastrium, increased by pressure. Two days before admission she observed a discolored patch on the right forearm and also some bleeding from the gums, which continued and was accompanied by the development of further areas of subcutaneous hemorrhage. The case afforded the typical scorbutic symptoms; there were no indications of local disease. Death occurred within ten days, during which period there had been bloody vomiting. At the autopsy the cervical portion of the uterus contained a typical infiltrating, small round-celled sarcoma, and there was a round-celled infiltration of the kidneys, spleen, and ovary; even the stomach and liver exhibited this same peculiar small round-celled infiltration; the former particularly in the submucosa, and the latter around the portal sheathes. In the skin were numerous circumscribed nodules of small round cells, and throughout the tissues there were extensive hemorrhages. The second patient exhibited a typical scorbutic appearance, and, in addition, there were numerous hemorrhagic tumors, some of which were slightly elevated with smooth surface and well-defined edges, and even these were not uniform in color. A diagnosis of multiple sarcomata with purpura hemorrhagica was made, and at the autopsy there was found primary sarcoma of the pelvic organs, which had advanced, to some extent, at all events, by way of the lymphatic system, and involved the glands in the neighborhood of the celiac axis. In the first case there were numerous, direct lesions of the vessels, the sarcoma cells involving the walls and being found mainly between the intima and adventitia with extensive involvement of the peri-vascular lymphatics. In case two, careful microscopic examination showed not only a definite invasion of the lymph spaces of the vessel walls, but also undoubted evidence of the existence of emboli of sarcomatous cells in the lumina of the blood vessels, and in the immediate vicinity of these changes hemorrhages were invariably found. The authors concluded that the purpura corresponded to the so-called embolic purpura that occurs in association with rheumatism, valvular lesions of the heart or other diseases which induce directly or indirectly the formation of emboli; however, as in some cases, much irregular hemorrhage had occurred where there was but little evidence of vascular invasion, they concluded that, in such instances, the combination of factors must be supposed to afford rational explanation of the purpura. Its other factors the authors take to be the fever, cachexia, and a rapid, progressive

asthenia as the result of the sarcomatosis, and all these imply grave alterations in the composition of the blood. A peculiar appearance was produced upon the abdomen in the second case by a few areas of distinctly raised nodules, consisting of a pale centre surrounded by a sharp, narrow ring of hemorrhage; these are explained as a result of the effort of the diseased vessels to set up a collateral circulation in the infarcted area, and were apparantly not sarcomatous, but rather local areas of serous infiltration and necrosis. While admitting the probability of some peculiar form of toxemia, the authors doubt that it occurred and, at all events, do not regard their case as allied to the infectious purpuras.

SAILER.

The Question of the Simultaneous Occurrence of Heart Disease with Pulmonary Tuberculosis. (*Deutsch. Med. Woch.*, December 24, 1896.) By Dr. R. Boltz.

The patient, a clerk of 20 years of age, was admitted to the hospital suffering from acute blenorrhea. His father had died of phthisis. The patient himself had always been well, although pale. Upon admission he was apparently exceedingly ill; there was a pleural exudate in the left side, containing clear serous liquid; the heart was greatly hypertrophied, and there were pre-systolic and systolic murmurs. He grew rapidly worse and died on the third day of his residence in the hospital. The post-mortem revealed old pulmonary tuberculosis with a fresh crop of milliary tubercles in the surrounding tissue, old and more recent tuberculous ulcers of the intestines, stenosis and insufficiency of the mitral ostium and congenital narrowness of the aorta. There was a high degree of renal contraction occasioned by old extensive infarcts and excessive venous congestion of the intestinal mucous membrane. Death had occurred as a result of hemorrhages from a ruptured ectactic vein in the floor of one of the intestinal ulcers. The aorta was but 7.5 cm. in diameter and the pulmonary artery 9 cm. in diameter. Boltz therefore concludes, in accordance with Virchow's theories, that the patient had always been chlorotic. As a result of this condition the left ventricle had become enormously hypertrophied with secondary enlargement of the right heart and excessive dilatation of the right auricle; besides this aortic stenosis there was also a stenosis of the mitral valves, and the two together must necessarily have caused a high degree of pulmonary cyanosis. [It is admitted, however, that in the lungs themselves there were no indications of chronic cyanotic induration, and the author is compelled to infer the same from the presence of hypertrophy of the right ventricle; moreover, he urges that in the intestinal tract, where all symptoms of chronic induration are present, extensive tuberculous ulcers had taken place. The author apparently concludes that his case indicates that cyanosis is of slight protective influence against the bacillus of tuberculosis.]

SAILER.

Diagnosis of Systolic Heart Murmurs. (*Deutsch. Arch. f. klin. Med.* Vol. 57., Nos. 3–4.) By Prof. W. Leube.

Accidental sounds are distinguished by three characteristics: 1, the presence of a normal area of cardiac dulness; 2, absence of accentuation of second sound; 3, heard only, or, at least, most distinctly at the pulmonary cartilage. Leube believes that these sounds originate in the large vessels, especially the pulmonary artery, and that they are brought about by a sudden dilatation of the walls of these arteries during systole, and the development of a state of vibration that gives rise to a murmur. The mitral valves, according to this theory, should close and therefore give rise to the normal first sound at the apex, and the first sound should also, and, in fact, usually is, heard at the pulmonary orifice just before the murmurs; however, in some cases in which these murmurs occur the first sound is absent and another explanation is necessary. Such an explanation can perhaps best be supplied by the fact that the resistance in the pulmonic artery is so greatly diminished that the normal equilibrium between the arterial and ventricular pressure is not maintained, therefore the increased rapidity of the current at the ostium causes a powerful stream to impinge upon the wall of the vessel where it bends and gives rise to a murmur. Accentuation of the second pulmonic sound indicates relative mitral insufficiency, as this tone depends upon the resistance of the pulmonary artery and the force of the right ventricle. Normally, pressure in the pulmonary veins is zero. If the latter be increased, the pressure in the lungs is also increased and the second tone is accentuated; however, if the capillaries of the lung can empty themselves and if the diastole is prolonged the increase may not be very great in a heart with mitral regurgitation; but if the heart's action becomes more rapid the capillaries remain full and the pressure of the pulmonary arteries is increased, and the accentuation of the second pulmonic sound occurs. As the right ventricle hypertrophies, the blood is thrown out with more violence and the accentuation becomes greater. The systolic impulse is usually felt in the fifth interspace and should be increased in force; therefore if the heart is enlarged to the right and to the left, if the impulse is increased and the second pulmonic sound accentuated, it is justifiable to make a diagnosis of chronic mitral insufficiency, especially if the murmur is accompanied by a pre-systolic sound. In acute cases, however, the right heart is seldom dilated, but the left is considerably enlarged. Intoxication such as occurs from poison or in the course of infectious diseases, sometimes gives rise to accidental murmurs by acting upon the blood or upon the vessels; sometimes, however, if the action is more intense, to relative mitral insufficiency. A differential diagnosis between pure endocardial murmurs and those of the endocarditis complicated by myocarditis, can be made by the fact that in the former enlargement the heart is mitral, the pulse is strong, and new murmurs, usually diastolic, have developed during the course of the disease. In case of functional mitral in-

sufficiency the symptoms are, of course, essentially the same as those of organic mitral insufficiency; the murmur is, however, softer, the impulse at the apex weaker, and the heart enlarged in both directions. Usually the murmur can be heard at the pulmonic cartilage as well as at the apex, and the second pulmonic sound is already accentuated. The diagnosis is rendered easier when the etiology is clear; thus in anemia one would expect a functional murmur and in acute rheumatism an organic murmur. In infectious fevers, however, both occur. If the right ventricle is also enlarged, in case of functional murmurs, myocarditis is probably present.

SAILER.

The Semiologic and Pathogenic Value of Intestinal Amebæ. (*Gazette des Hôpitaux*, October 17, 1896.) By Albert Mathieu and Maurice Soupault.

The search for amebæ in the stools is very difficult. These microorganisms are extremely frail and they die very rapidly after their expulsion from the intestine. They lose their motility, therefore, which is their principal distinctive characteristic and which alone serves to distinguish them with certainty from the epithelial cells of the intestine, to which they offer more than one point of resemblance. By a sterilized pipette, larger than the pipettes which one ordinarily employs for bacteriological investigations, a small quantity of the mucous material or liquid of the stool is obtained. This should be placed at once on the slide or should be kept in sterilized distilled water at a temperature of 37°C. In examining the material no stain should be used. A warm stage should be used in winter; but this precaution is not necessary in summer. Culture of amebæ is possible and, indeed, is quite easy. In the best media two forms may be distinguished, the ameboid and the encysted parasite. The first form is obtained when the medium presents the conditions favorable to the nutrition and life of the organism; the encysted form is found when the ameba finds less favorable conditions. From a review of the literature the following facts may be noted: 1. Amebæ are met with quite frequently in healthy individuals who present no intestinal manifestations, particularly no diarrhœa. 2. Amebæ may appear in large numbers in the liquid stools of a healthy man after saline purgation. 3. Amebæ have been met with in large numbers in cases of dysentery; but they are not always to be found in dysenteric stools. Certain observers have not seen them in epidemics of dysentery with grave manifestations. Other observers have only seen them in a certain number of patients, generally in those who have the worst attacks. 4. Amebæ have often been found in diarrhœal stools, when the patients presented no dysenteric manifestations. They are then much more numerous than in healthy individuals. Usually they disappear when the diarrhœa is cured or when it is less severe; but sometimes they disappear at a certain period of the attack without ap-

parent modification of the number or nature of the stools. 5. The certain relation between the clinical form of the diarrhœa and the form of amebæ found in the stools has not been established. The presence of these parasites in the fecal matters of healthy individuals either spontaneously or in the liquid stools produced by a saline purge; their absence in certain cases of dysentery, and their quick disappearence in cases of diarrhœa without the cessation of the diarrhœa constitute serious objections to their pathogenic value. However, one may ask if certain varieties are not innocuous and others morbid; if one indifferent variety may not acquire virulent properties under certain conditions of intra-intestinal culture? From experimental evidence it is premature either to admit of or to reject definitely the pathogenic action of amebæ. The authors ask if the presence of these organisms in large number and their increased virulence may not aggravate certain diarrhœal or dysenteric affections of the intestine? Personally they tend to such a belief but they do not consider that the fact is definitely demonstrated.

JOHN M. SWAN.

Concerning Fecal Tumors. (*Wein. Med. Woch.*, October 17, 1896.) By Professor Hoffmokl, of Vienna.

The author criticizes Gersuny's article in which he described the *Klebe-symptom*. As he has never been able to elicit it, he concludes that it only occurs in special instances, especially where hypertrophy of the wall of the bowel gives rise to certain degrees of rigidity. A more important symptom is, perhaps, the indentibility of the tumor, a condition that can be elicited satisfactorily only in anesthesia, on account of the extreme tenderness of the abdominal wall. This symptom, however, can be easily made out in pregnant women with fecal impaction through the posterior vaginal wall. Hoffmokl reports two cases in which the diagnosis was only made after laparotomy had been performed, in both of which recovery ensued after treatment by massage and enemata.

SAILER.

Two Years' Treatment of Diphtheria with the "Antitoxin Serum." (*Deutsche. Med. Woch.* December 24, 1896.) By Dr. Cuno.

Four hundred and eighty-three cases in all were treated, of which 282 were severe, 112 moderate and 89 mild; of all these 51 died, or 10 5-10%; 5 of these cases were moribund when admitted and died within a short time, and 12 died of other diseases after all traces of diphtheria had disappeared. For the previous five years the mortality had never been less than 32% and averaged about 36%. In all of these cases the local treatment was entirely omitted, and the effects can be due only to the antitoxin. Beneficial results were usually observed within fifteen hours after the injection; in no case was there sudden fall of temperature,

and in all there was striking improvement in the local condition. An interesting feature was that in no case after the serum was used was there any further descent of a laryngeal membrane; in all cases where there were severe symptoms of stenosis, providing operation was not necessary in the first twelve hours, the stenosis disappeared of itself. Of the 54 cases in which tracheotomy was necessary, death occurred in 17. All the usual complications of diphtheria, such as acute nephritis, heart weakness, and paralyses, were less frequent than was formerly the case and usually occurred in those cases in which the treatment had been commenced very late in the disease. Exanthemata occurred in 104 cases, usually accompanied by high fever and the presence of albumin in the urine; occasionally there were severe joint pains. Of 640 injections, the only accidents were local abscesses in 8 cases. In 291 cases, diphtheria bacilli were found and of these 38 died. Cuno is so impressed with these results that he believes it should be imperative, that an injection of antitoxin be given in every case of diphtheria as soon as the diagnosis is suspected.

SAILER.

I. Röntgen Rays Applied to the Diagnosis of Pulmonary Tuberculosis. (*Gazette des Hôpitaux*, December 22, 1896.) By Charles Bouchard.

II. Application of Skiascopy to the Diagnosis of the Diseases of the Thorax. (*Gazette des Hôpitaux*, January 5, 1897.) By Charles Bouchard.

III. New Facts Concerning the Skiascopy of Intrathoracic Lesions. (*Gazette des Hôpitaux*, January 7, 1897.) By Bergonié.

IV. Skiagraphy. (*Gazette des Hôpitaux*, December 31, 1896.) By Poncet, of Lyons.

I. Professor Bouchard has shown that a skiagraphic examination of the diseased side in cases of pleural effusion results in the production of a darker tint than is obtained from the healthy side of the chest. In one of the patients thus examined, as the pleural effusion was being absorbed, the opacity persisted at the summit of the lung. Finally, when this effusion had almost entirely disappeared, the apex of the lung continued to remain obscure. Percussion and auscultation confirmed the existence of a beginning infiltration of the lung. In all tuberculous patients which have been examined by the aid of the fluorescent screen the existence of a shadow of the pulmonary lesion has been proved and its extent has been shown to be in close relation with that indicated by physical examination. The intensity of the shadow depends upon the depth of the lesion. Clear spaces appearing on the dark background indicate the presence of cavities. In one patient the general signs and the cough gave rise to the suspicion of a beginning tuberculosis; but the examination of the expectoration did not show the bacilli and the physical signs did not warrant a positive diagnosis.

Skiascopy showed that the apex of one of the lungs was less permeable than that of the other and a few days afterwards auscultation and bacteriological examination left no doubt as to the diagnosis. In diseases of the thorax skiascopy gives results which are in every way comparable to those obtained by percussion.

II. In this paper Professor Bouchard states that he has been able by the aid of the Röntgen rays to diagnose infiltration of the base of one of the lungs, tuberculous infiltration of the entire left lung, adenoma of the trachea and bronchi, transposition of the heart, aneurism of the arch of the aorta, dilatation of the aorta, hypertrophy of the heart following arteriosclerosis, and, in the latter case, the auricles could be seen beating at the right of the sternum. The application of skiascopy to the study of diseases of the abdomen has given less satisfactory results.

III. Professor Bergonié has met with complete success in repeating the methods of Bouchard concerning the use of the Röntgen rays in the diagnosis of pulmonary tuberculosis and intrathoracic lesions.

IV. Poncet presented at the meeting of the Academy of Medicine, held December 29, 1896, a series of skiagraphs made by Destot and Bérard, which represented the arterial and venous circulation of the kidney in different pathological conditions. From their studies the authors conclude: First, that the circulation in the kidney is lobar and terminal and permits the differentiation of an independent anterior and posterior kidney, except the artery of the superior lobe, which often divides into two branches, so that when it is injected the entire upper portion of the kidney is injected. Second, the interpyramidal artery divides by false dichotomy in the neighborhood of the cortical substance, but does not anastomose with its collateral; there are no arterial arches. Third, the arteries immediately give off a mass of capillaries which at once form the glomeruli, without passing through a number of vessels of intermediate size. In injected specimens the capillaries may be seen springing directly from the arteries like pine needles spring from the pine branches. Fourth, the arteries of the pyramids come from the glomeruli. Fifth, the veins form free anastomoses, and the entire kidney may be injected through a single small vessel. The use of the X-rays and of the stereoscope, combined with metallic injections, in the study of angeiology, will result in the clearing up of obscure points concerning the circulation in the different organs.

JOHN M. SWAN.

THERAPEUTICS.

A Case of Acute Spreading Gangrene Treated with Antistreptococcic Serum. (*British Medical Journal*, December 19, 1896.) By Ernest A. T. Steele, L.R.C.P., Lond., of Plaistow.

The case was that of a child aged one and a-half years, who had burnt herself with a red-hot poker on the calf of the left leg. The wound was dressed by the mother with linseed oil, but did not heal; the child's health began to fail and it became pale and languid, refusing food. About two weeks after the accident a red spot appeared in the centre of the forehead and also a small abscess on the left lower eyelid. The next day the spot on the forehead was "as large as a shilling," having turned black in the centre; an offensive discharge was noticed from the left nostril. Four days later the gangrenous patch on the forehead had become "as large as a five-shilling piece." The edges were inflamed and undermined, the gangrene extending more rapidly in the subcutaneous cellular tissue than in the skin. The child's general condition was very bad. Temperature, 101.8°; pulse, 120. Under an anesthetic the edges of the gangrenous area were clipped away, to expose the whole extent of the wound, until a healthy raw surface was reached. The surface was mopped frequently with nitric acid. The ulcers on the eyelid were scraped with Volkmann's spoon and treated with the acid. On the evening of the same day the temperature had dropped to 97.4°, but the next day it rose again to 101.8°, and gangrene recommenced on the upper edge of the forehead wound. She was once more anesthetized and the clipping and cauterization repeated. In the next two days there was no recurrence of gangrene, but the temperature remained high. On the third day after the last operation, the ulcers on the leg and eyelid began to slough, and were again scraped and cauterized with carbolic acid. On the second day after this period she was much worse. She refused nourishment. The Clinical Research Association having reported large numbers of streptococci present in a scrap of tissue taken from the edge of the skin adjoining the gangrenous tissue, an injection of 5 c.c. of antistreptococcic serum, prepared by the British Institute of Preventive Medicine, was now administered, and brandy and liq. strychninæ were given internally. No other local treatment was used. From this date the progress toward recovery was steady. On July 4th suppuration took place in the right elbow joint. This was incised on July 7th and the joint drained. The eyelid and leg healed rapidly, and the discharge from the nose ceased. The separation of the eschar on the forehead exposed a large surface of bone, but this has now granulated over. She is now quite well. The most noticeable feature of this case is the sudden and striking cessation of the gangrene and phagedenic ulceration after the use of the antistreptococcus serum, and can, in the author's opinion, only be attributed to its action.

CATTELL.

Pyramidon.—Filenne (*Berl. klin. Woch.*, November 30, 1896,) gives details of eight cases illustrating an antipyretic effect from the use of pyramidon.

This yellowish white crystalline substance is a dimethyl amido-derivative of antipyrin and is soluble in water in the proportion of 1 to 10. Its effect on the nervous system is like that of antipyrin, otherwise there are considerable differences in the mode of action. Pyramidon acts in smaller doses than antipyrin, and its beneficial effects result more gradually and are more lasting. In healthy men 0.5 grammes produced no effects, subjective or objective. In 20 minutes the urine gives the ferric chloride reaction. The dose used in patients varies from 0.1 to 0.75 grammes. In the adult it is best to begin with 0.3 to 0.5—twice repeated in a day. It must remain a matter of experiment how far these doses may be increased. The remedy has been found to act promptly in various regions of pain, such as headache, tuberculous peritonitis, *etc.* No effect was obtained in four cases of nephritis in which pyramidon was tried.—*British Medical Journal*, December 19, 1896.

The Treatment of Warty Growths of the Genitals. (*International Journal of Surgery*, January, 1897.) By William S. Gottheil, M.D.

In a paper on epithelioma of the penis, read before the Society for Medical Progress, November 14, 1896, Gottheil concludes as follows:

1. Warty growths of the genitals, more especially in the male, are always to be suspected of malignancy, no matter how innocent they seem.

2. They should either be left entirely alone or be thoroughly removed by knife or cautery.

3. Imperfect attempts at destruction, as with nitrate of silver, carbolic acid, *etc.*, are especially to be avoided; there being many cases recorded in which these agents have apparently stimulated a benign growth into malignant action.—*Author's Abstract.*

Chronic Sulphonal Poisoning. Schulz (*Neurol. Centralb.*, October, 1896), records a case of chronic sulphonal poisoning with fatal ending. The patient, a woman aged 59, had been under treatment some years for headaches, constipation and restlessness, and was extremely hysterical. On account of sleeplessness she had recently been taking sulphonal in doses of 15 grains, and had taken altogether about half an ounce within a month. When admitted to hospital for obstinate constipation with vomiting, there was a smell of acetone in the breath, the tongue was dry and furred, there was great thirst, with restlessness and insomnia. All the organs otherwise were normal; the urine was normal. The next evening sulphonal, gr. xxv, was given, and the following day the urine was scanty, brownish-red in color, but free from albumen. Four days later the gait was unsteady, and five days after this there was weakness of the limbs, with anesthesia of the

legs down to the ankles; knee-jerks, previously normal, were now difficult to obtain. Weakness increased, the knee-jerks disappeared, incontinence of urine and feces occurred, and two days later the patient died suddenly The urine since the single dose of sulphonal mentioned had continued brownish-red with no albumen, but a few altered red blood corpuscles. The color was found to be due to hematoporphyrin. Schulz considers that the toxic results after only one dose of sulphonal were due to the obstinate constipation present, causing the sulphonal to be retained in the body longer than usual. Great caution should therefore be exercised in ordering sulphonal for patients who are constipated, and where it is ordered a careful watch should be kept on the urine for hematoporphyrin—*British Medical Journal*, November 25, 1896.

SURGERY.

The Etiology and Lesions of Hospital Gangrene. (*Annales de l'Institut Pasteur*, September 25, 1896.) By H. Vincent, M.D.

This writer describes a special bacillus which he has found in the false membrane on the surface of the ulcers in every case of hospital gangrene which he has examined. In seven grave cases this organism was the only one present, and in all the cases it was present in great numbers associated either with pus organisms or with a spirillum which was found in forty of the forty-seven cases tested. This bacillus is from four to eight mikrons in length and about one mikron in thickness. It is straight or slightly sinuous, but in certain preparations presents S-shaped involution forms. The ends of the rods are thinned and rounded. Many of the bacilli are in the process of segmentation or articulated two by two. They are distributed in groups of three or four, but near the surface form filaments. In preparations stained with methylene blue the protoplasm of the bacillus is stained unevenly; being at certain points scanty and colorless, while at others it is a dense blue. This gives an appearance of spores, but they can be excluded by staining by the Ziehl-Neelsen method. These bacilli are non-motile and are decolorized by the method of Gram. They have great resistance against antiseptic agents. The writer has found them in great numbers on the surface of an ulcer which he had treated for ten days with iodoform and compresses of bichloride of mercury. A microscopical examination of fragments of gangrenous tissue shows two distinct zones; the superficial, consisting of the diphtheritic exudate, is from one-half to two or three millimetres in thickness and is of a grayish-blue color on the surface where the cell elements are scanty, and of an intense blue in the deeper layer where the bacilli are actively proliferating and form a compact layer. The deeper zone, adjacent to the preceding, is formed of the gangrenous tissue infiltrated with blood and

always profoundly altered by the bacilli. All trace of definite structure is lost at a certain depth, and in the vicinity of the microbes an abundant layer of embryonic cells forms a barrier of defense. This organism has never been found in the blood. The writer has not been successful in cultivating this bacillus on an artificial medium. Inoculation of rabbits, guinea-pigs, and white rats has given negative results which favor the theory that this gangrene is confined to the human species. Inoculation, subcutaneously, into three healthy Arabs, with negative results, indicates that certain adjuvant factors may be necessary to produce the multiplication of this bacillus. Animals suffering from tuberculosis and with inanition were inoculated subcutaneously with the gangrenous exudate and developed typical ulcers covered with a membrane which contained great numbers of the bacilli.

ADELAIDE W. PECKHAM.

The Phonendoscope as an Aid in the Detection of Stone in the Bladder. (*British Medical Journal*, January 9, 1897.) By Godfrey Goodman.

The author was led to suggest the attachment of the phonendoscope to the bladder sound when searching for vesical stone in a case in which the ordinary procedure did not give aural evidence of the calculus. On attaching a phonendoscope to the sound, the click accompanying the stroke of the instrument upon the calculus was clearly apparent.

JOHN M. SWAN.

Vertebral Osteomyelitis. (*Gazette des Hôpitaux*, December 12, 1896.) By A. Chipault, of Paris.

The author reports three cases of acute osteomyelitis of the vertebræ and gives abstracts of 28 other cases which have been recorded in the past few years, making a total of 31. Osteomyelitis of the vertebræ may constitute the principal focus of the disease, or it may make a part of a train of multiple osseous lesions: in both instances it may be accompanied by the most varied visceral infections. The pathogenic agents have been isolated in a very small number of cases. The *Staphylococcus pyogenes aureus* has been found in four instances, and the *Streptococcus pyogenes* in one case only. Ordinarily the subject has undergone excessive fatigue, has been exposed to cold for a long time, or has received an injury of some kind. Male children are most frequently attacked and the disease usually develops during the period of the growth of the skeleton. The lesions may be superficial, sub-periosteal, deep, or involving the entire bone; the bone may be merely denuded, or larger or smaller sequestra may be formed; justa and intra-osseous phlebitis may be set up. The disease may develop in any part of the spine; but the dorso-lumbar region is most frequently involved, and the postero-lateral aspect of the vertebræ

is the most common point of development of the lesion. During the course of the disease complications arise in the neighborhood of the trouble which may be divided into perirachidian and vertebral canal lesions. The perirachidien complications may involve the neighboring articulations, or they may be of the nature of abscesses, which take a similar course to those formed during the progress of Potts' disease. The fluid collections formed during osteomyelitis may be distinguished from similar formations associated with Potts' disease by the greater rapidity with which the former extend, and by the lessened tendency which the latter have to rupture the aponeurotic or serous barriers which they encounter. Among the vertebral canal complications may be noted suppuration of the peridural cellular tissue, which may extend to the intracranial peridural space; endomeningitis, due to perforation of the dura mater; edematous myelitis; and endomeningitis, suppurative or non-suppurative, due to infection by the blood paths. The latter affection may extend to the cranial cavity and to the ventricles. The symptoms of the disease may be general or local. The general symptoms are those of all acute infectious processes. The local symptoms depend upon the seat of the lesion. If the disease attacks the posterior portion of the vertebræ, there will be complete immobilization, edema, and deep swelling, extensive and hard. This area of swelling may be covered over by dilated veins, may be in the median line or unilateral, and is very rarely fluctuant. If the lesion is in the body of the vertebra, there will be rigidity and tenderness of the spine, rarely associated with bony deformity; but more often combined with the symptoms of the complications arising in the different regions of the spinal column. The evolution of the disease is usually very rapid and if left to itself will terminate fatally, with the symptoms of a general infection, on the fifteen or twentieth day. The diagnosis is easy when the symptoms of an acute perivertebral collection exist. The acuity of the symptoms in this disease serve to distinguish it from the abscess formation accompanying Potts' disease. When the symptoms of meningo-myelitis are prominent, the diagnosis is difficult. The treatment should be only operative, the object of which is to evacuate the collected pus and the sequestra, and then to disinfect and drain the focus of disease. When the purulent collection is opened the surgeon ought always to search for the diseased point of the bone. If the bone is merely denuded it should be scraped with a sharp curette and then cauterized; if it is necrosed the bone should be removed, especially if the arch, or a transverse, or spinous process of a vertebra is affected. Whenever there are symptoms of infection of the spinal canal, that space should be freely opened by the removal of the diseased vertebral arches, and of healthy arches, if necessary, so that the pus may be evacuated. In all cases of vertebral osteomyelitis cure may be obtained when surgical treatment is applied with sufficient haste and boldness.

JOHN M. SWAN.

NEUROLOGY.

A Case with the Symptom-Complex of Weber followed by Autopsy. (*Revue Neurologique*, No. 22, 1896.) By A. Souques, M.D. and Gaston Bonnus, M.D.

The writers describe the case of a woman who had right hemiplegia with total paralysis of the left oculomotor nerve (symptom-complex of Weber). The arteries at the base of the brain were atheromatous. An area of softening was found in the centre of the left occipital lobe, and another was observed within the left crusta, which, however, did not destroy the oculomotor nerve of this side, although it was in close proximity to it. On account of coma, hemianopsia had not been sought for. The cause of the crustal softening was supposed to have been thrombosis of certain of the arteries which supply this part.

SPILLER.

Concerning Spinal Epilepsy. (*Neurologisches Centralblatt*, November 22, 1896.) By Dr. Bresler.

Two children belonging to the same family suffered from epileptic convulsions, which began in childhood. During the periods intervening between these attacks, peculiar, abrupt, involuntary movements in the entire body were noticed. These were so severe that the patients were rendered helpless, and had to be fed and dressed. An autopsy was obtained in one of these cases. The pia over the central lobes was cloudy; the gyri, especially those of the occipital lobes, were flattened, and both lateral ventricles were distended. Russel Reynold has stated that nearly three-fourths of all epileptic patients have some form of motor disturbance in the periods between the attacks. These two cases are also very like those described by Unverricht. The myoclonia was the chief symptom; the epileptic attacks were secondary in all these cases, but of diagnostic value in excluding hysteria. The numerous scars and the mental deterioration were in evidence of epilepsy. Bresler regards the symptom-complex in his cases as due to an epileptic neurosis, and refers to the experiments of Brown-Séquard, in which epileptiform convulsions were produced in guinea pigs by injury of the spinal cord. By epileptic myoclonia, or spinal epilepsy, Bresler means muscular contractions due to disease of the motor neurones of the first order, to which disease of the neurones of the second order may be added, and he believes that the myoclonia associated with epilepsy in his two cases was of spinal origin.

Friedreich thought that the lesion in paramyoclonus multiplex is in the anterior horns, and Unverricht has accepted this view. Turtschaninow, Unverricht's assistant, caused myoclonic contractions by injecting carbolic acid into dogs, and observed these movements after removal of the cerebrum or after section of the spinal cord high up in the cervical region. Bresler will not say that myoclonia occurring without epileptic attacks is a

neurosis of epileptic nature. Sepilli has reported three cases of myoclonia associated with epilepsy, and he believes that the myoclonia was of cortical origin. [It does not seem to us that Bresler has proved his point. Results obtained from experiments on animals, especially in the motor sphere, may not be applied directly to man. It is well known that destruction of the cortical motor area in the lower animals does not cause permanent paralysis, and it is probable that the spinal motor centres are more independent of cortical control than they are in man. There are, nevertheless, some cases reported in which irritation of the peripheral motor neurones by morbid processes in man has seemed to produce contractions.]

SPILLER.

On the Symptomatology of Gross Lesions (Tumors and Abscesses) Involving the Pre-Frontal Region of the Brain. (*Brain*, Parts LXXIV and LXXV, 1896.) By R. T. Williamson, M.D.

Williamson reports 5 cases with lesions situated in the pre-frontal region, and analyzes also 45 cases recorded in medical literature. The list comprises four cases of abscesses and 46 of tumors of various kinds. Headache was prominent in most cases. Usually the pain was most intense in the frontal region, in a number of cases it was most severe in the occipital region. In cerebellar tumor the headache is often occipital, though it may be frontal. *Tenderness on Percussion of the Skull.*—This was mentioned in 15 cases as being present in the frontal region. If tenderness is present on percussion, it appears to indicate the region of the skull in which the growth is situated. If tenderness in the frontal region is unilateral the growth is usually on the side of the tenderness. Tenderness is not a sure indication of cortical growth, though it is a useful sign. *Ophthalmoscopic Examination.*—In seven out of 35 cases in which ocular changes were noted, the failure of sight or the ophthalmoscopic changes were on one side only, or were very much greater on one side. In six of these seven cases, the marked ocular changes were on the side of the lesion. *Sense of Smell.*—There was mention of loss of smell in seven cases, and in these the growth involved the region of the olfactory nerves. Loss of smell, if present, is an important symptom. *Exophthalmos.*—This sign was bilateral in one case, unilateral (on the side of the growth) in two other cases. *Localized Swelling* in the frontal region of the skull was recorded in one case. *Motor Symptoms.*—Paresis, or paralysis of the face or arm or leg on the side opposite the lesion was observed in many cases at some period, but usually it was very slight, and was often noticed only at the end of the illness. *Convulsions* were met with in many cases. *Anesthesia* was never recorded. *Ataxia* was mentioned in 14 cases. *Knee-jerks.*—It has long been known that the knee-jerks are sometimes absent in cerebellar lesions, while in other cases they are increased. Why this difference should exist is not known. Of 30 of these cases of frontal lesions

the knee-jerk was absent in 20 per cent. In only one of these cases was microscopical examination made of the lumbar region and with negative results. (It is not stated that the examination was made by the method of Marchi. By means of this method degeneration of the posterior columns has been found in the lumbar region in cases of cerebellar tumor with loss of the knee-jerk.) *Mental Symptoms.*—These were noted in most of the 50 cases of lesions of the frontal lobes. As a rule the patients were comatose, even a long time before death in some cases. The diagnosis between lesions of the pre-frontal region and of the cerebellum is difficult. In the former mental symptoms are prominent and early. Unilateral paresis also at a late period occurs in a number of cases. Convulsions are more common in pre-frontal lesions. Tenderness to percussion over the frontal region is a valuable sign, as is also optic atrophy unilateral or predominating on one side. Localized swelling in the frontal region, unilateral exophthalmos, and loss of smell are valuable signs if present; although the latter has been reported in cerebellar tumor. In the four cases of abscesses surgical interference would have been justifiable. In 7 cases the tumor could easily have been removed even at the time of the autopsy. In 2 cases a tumor was removed and in one case successfully.

SPILLER.

Röntgen Photography in the Diagnosis of Acromegaly. (*Comptes Rendus des Seances de la Société de Biologie*, June 19, 1896.) By G. Marinesco, M.D.

Marinesco has submitted the hands of four subjects of acromegaly to Röntgen photography as follows: Three of the patients belonged to the massive type, described by Marie, while the fourth, a woman of 33, was of the gigantic type. In the first case a man, aged 55, of the massive type, whose affection was of 11 years standing, the skiagraphs showed a marked hypertrophy of the metacarpal bones and phalanges. This hypertrophy was uniform; it was merely an exaggeration of the normal state. The epiphyses and apophyses of the last phalanx were hypertrophied and measurements were readily made from the skiagraph. In the third patient, aged 33 years, who presented the giant form of the disease of eight year's duration, the skiagraph showed that the hypertrophy of the soft parts in relation to that of the bone was much less than in the first case. In the fourth patient, aged 33, an example of the massive type, which was of at least seven years' duration, the skiagraph revealed a hypertrophy of the extremities of the phalanges and of the metacarpals. In this case the distance from the metacarpo-phalangeal articulation to the extremity of the last phalanx was 11 cm. 2 mm. There was an hypertrophy in length and in thickness. It was thus easy to demonstrate the clinical type to which a case belongs by noting the relation between the hypertrophy of the soft parts and the bones. In acromegaly of the massive type, the hy-

pertrophy of the soft parts is much greater than in the case of acromegaly of the giant type. Marinesco also examined a case of erythromelalgia in the same manner and failed to find any lesions of the skeleton, which shows that this affection has no relation to acromegaly.

GUY HINSDALE.

A Case of Pontine Tumor. (*Archiv. für pathologische Anatomie und Physiologie und für klinische Medicin.*, Vol. 146, No. 3, 1896.) By Dr. Hofmann.

The chief symptoms in this case were headache, vomiting, vertigo, ataxia and right-sided deafness, associated with progressive paralysis of the muscles supplied by the seventh, sixth, fourth, third and some of the sensory fibres of the fifth nerve on the right side, and with paralysis of the left internal rectus. The left external rectus was temporarily affected. Sensation on the left side of the body was less acute. Anarthria and convulsions later were noted. There was no paralysis of the extremities and no papillitis. At the autopsy a tumor, which had undergone cystic degeneration, was found in the pons, chiefly on the right side. The pyramidal tracts were uninjured. It was believed that the paralysis of the left internal rectus was due to destruction of the fibres in the posterior longitudinal bundle which connect the right sixth centre with the left third nucleus. The temporary paralysis of the left external rectus was probably the result of pressure. The right facial nerve and the posterior part of the sensory nucleus of the right trigeminus were destroyed. The descending sensory root of the fifth and the third and fourth nerves were pressed upon. The hypesthesia of the left side is explained by the involvement of the *lemniscus*.

SPILLER.

The Centre for the Muscles of the Trunk in the Cerebral Cortex. (*Neurologisches Centralblatt*, No. 24, 1896.) By Max Rothmann, M.D., of Berlin.

The location of the centres for the muscles of the extremities is definitely established, but very different opinions are held as to the position of the centre for the trunk muscles. It has been thought that the muscles of this part of the body have their cortical representation in the frontal lobe, though some investigators have placed this in the marginal gyrus, while others have sought it within the area occupied by the centres for the extremities. From a series of experiments which Rothmann performed in order to determine this point he concludes:

1. The region of the central convolutions in which the centres for the extremities are located has no connection with the muscles of the trunk in the dog and cat. 2. The arching of the vertebral column after electrical

irritation of this region is caused secondarily by the vigorous contraction either of the ilio-psoas or the muscles of the shoulder, without the slightest participation of the trunk muscles. It seemed probable to Rothmann from his experiments that a direct connection exists between the frontal lobe and the spinal centres for the trunk muscles of the opposite side, and yet after extirpation of this lobe he found no degeneration by the method of Marchi in the pyramidal tract of the cord, although he observed degenerated fibres passing downward and backward from the frontal lobe. If connection exists it must be by means of two neurones.

SPILLER.

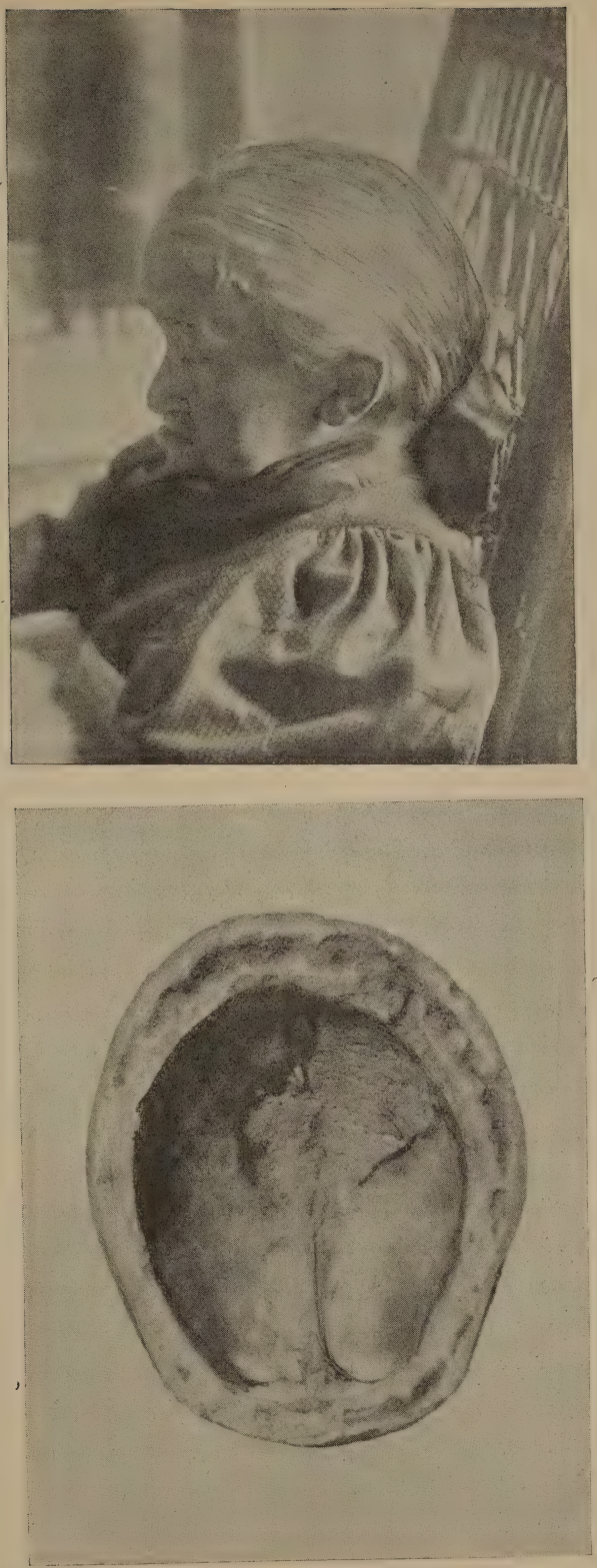
A Contribution to the Etiology of Bernhardt's Disturbance of Sensation in the Thigh. (*Neurologisches Centralblatt*, November 22, 1896.) By August v. Luzenberger, M.D.

Dr. Luzenberger describes paresthesia in the area innervated by the external cutaneous nerve, which developed in his left thigh after striking the sharp edge of a table. It was not until about five years after the accident during recovery from tonsillitis follicularis that the disturbance in sensation was distinctly felt. All the cases of this affection, with one exception, have occurred in men. Näcke ascribed the condition in his own person to trauma. Luzenberger believes that the trauma had rendered the external cutaneous nerve of the thigh especially sensitive to infection, and that a neuritis was produced in this way. He observed objective disturbance of sensation in his thigh. Freud also has described this condition in his own person.

SPILLER.

Hyperostosis Cranii. (*Codex Medicus*, May, 1896.) By Charles Herwirsch, M.D.

The specimen was presented by Dr. Herwirsch to the College of Physicians of Philadelphia, and was exhibited by Dr. Guy Hinsdale at the last meeting of the American Neurological Association. It was from a woman who was in good health up to her sixty-fourth year, when she had an attack of rheumatism confining her to bed for one year. Previous to this she had been of a lively disposition and a hard worker. During this illness the enlargement of the head began. She became listless, disinclined to any conversation and made frequent cries at night. She had insomnia, and near her death, which occurred March 13, 1896, at the age of 71, she refused food and became comatose. Her head measured 71 cm. in fronto-occipital circumference. The lower half of the head was not enlarged. There was slight bowing of the long bones of the lower extremities, most marked in the left leg. The calvarium was soft and friable. The brain weighed 1360 grammes (48 oz.) and was normal, except for some ventricular dilatation and thickened dura. The skull at the thickest portion, right



Patient and cranium of Dr. Herwirsch's case of *Hyperostosis cranii.*

occipital, measured 3.5 cm.; at the frontal 2 cm., and at the thinnest portion, left temporal, 1.4 cm.; weight of skull cap 1870 grammes (4 lbs. 2 oz.). Both femora were thickened and the epiphyses covered by osteoplastic incrustation or exostoses of friable bone. (See illustrations on previous page.)

GUY HINSDALE.

PATHOLOGY.

Some Experiments on the Production of Pleural Effusions. (*Journal of Pathology and Bacteriology*, December, 1896.) By J. B. Leathes, M.B. (Oxon), and E. H. Starling, M.D. From the Physiological Laboratory of Guy's Hospital.

The experiments of these authors range themselves under three heads: 1. The effects of raised capillary pressure; 2. Effects of injuries to the vessel-walls; 3. On the place of origin of the effused fluid. In studying the effects of the rise of capillary pressure in pleural exudation, one is met at the outset by the difficulty that no one vessel will cause a general rise of venous pressure in the walls of the pleural cavities. The effects of the obstruction of the azygos vein may be shown in two ways. A bent catheter with an India-rubber bag tied on the end may be passed down the right jugular vein, until its point is hitched on the azygos vein. The tube is then pushed down the azygos vein a short way and the balloon distended with water. The obstruction should be left in place until the animal is killed, to render it certain that it has been properly inserted. No edema of the wall in the experiment in question was seen; there was some infiltration of the posterior-mediastinum; 2.3 c.c. of fluid on the side of chest; pleura normal. It is true, these experiments do not remove the possibility of causing hydrothorax, by increasing the venous pressure. Such a condition could not be reproduced on the experimental table. The nearest approach to this would be by injecting large quantities of fluid into the circulation. An important difference between this condition and that seen in heart disease (uncompensated valvular disease) is that in the former the blood-flow is greatly quickened, while in the latter it is more sluggish than normal. But even when large quantities of fluid were injected, no exudation into the pleural cavities was produced, even when the azygos vein and thoracic duct were obstructed at the same time. The conclusion is justified then, that in a healthy animal, a moderate rise of pressure in the pleural and mediastinal capillaries will produce no exudation into the pleural cavities. It was found much easier to produce effusion by damaging the capillary-walls. Croton oil does not seem to be suitable for this purpose; an injection of 2 c. mm. causes death in 24 hours, without much change in the pleura. The most successful means of producing pleuritis will be

found in the proteids of jequirity. As long as the lesion is confined to the most superficial layer of the pleura no exudation is absorbed. Such a superficial injury was produced in two cases by injection of hot water into the pleural cavities; but in neither case was there any markedly increased amount of pleural fluid. The simple injection of abrus proteids causes a moderate pleuritic effusion, with only a transitory effect upon the health of the animal. It is probable that the fluid is poured out in the tissues surrounding the pleura. It has been shown that any fluid injected into the sub-pleural connective-tissue spaces makes its way into the serous cavity, whence it may be taken up by the lymphatics ramifying in the pleural membrane. An accumulation of fluid in the pleural cavities is most generally associated with edema of the posterior mediastinal tissues. The question, therefore, arises whether the fluid distending these tissues comes from the pleural cavities or *vice versa*. In two experiments these fluids were rendered edematous, by allowing normal saline fluid to run into the carotid sheath from a burette. We must conclude, therefore, that any excessive exudation of fluid in the sub-pleural or mediastinal tissues will make its way into the pleural cavities and cause pleuritic effusion. Normally, this fluid will be carried off as fast as it is made by the lymphatics, or may be absorbed by the surrounding venous capillaries. It is to be concluded, clinically, from these experiments that so long as the vessels are healthy, no changes in the pressure of the blood in the capillaries supplying the pleura will cause pleural effusion; in the hydrothorax of heart disease there are probably several factors—the raised capillary pressure, some hydremic plethora, etc.; but in the exudation of pleurisy the chief factor is an increased permeability of the walls of the vessels in the subpleural and mediastinal tissues. The increased exudation produced makes its way in the direction of least resistance, *viz.*, into the pleura. The clots formed adhere to the pleural walls, tending to check absorption. In every case, therefore, where effusion into the pleura is produced, diminished absorption is associated with the increased exudation of fluid from the blood vessels.

CATTELL.

A Method of Preserving the Natural Color of Specimens for Museums. (*Berliner Klinische Wochenschrift*, August 31, 1896.) By C. Kaiserling, M.D., of the Pathological Institute in Berlin.

This investigator reports his successful experience in the line of the preservation of the natural color of pathological specimens. Aided by the previous experiments of F. Blum, D. H. Plenge and Jores, Dr. Kaiserling found by his own experience that a mixture containing formalin, 750 cubic centimetres; distilled water, 1,000 cubic centimetres; potassium nitrate, 10 grammes; and potassium acetate, 30 grammes, would answer all the purposes of a preservative fluid. Dr. Kaiserling's formula differs favorably from

all others recommended with the same object in view because: 1. It preserves the transparency of the specimen. 2. It does not absorb any coloring matter from the blood. 3. It acts quickly, and may be used over and over again. Furthermore, it is probable that even the minute structure of the specimen remains unaltered in the fluid for an indefinite time. At all events, the observations during a period of four months justify this statement. How long the specimen will retain its natural color cannot yet be determined, as sufficient time has not yet elapsed to form a reliable and definite conclusion. The method is simple and inexpensive, and the preservation requires but three days.

The details of the procedure are as follows: the heart, kidney, and brain, for instance, are kept during a period of twenty-four hours in Kaiserling's fluid, though no harm is done if they remain here thirty-six or forty-eight hours. The specimen is then transferred to alcohol of 80% where it remains for not longer than twelve hours. Subsequently it is put in alcohol of 95% for two hours, and finally preserved in a mixture of equal parts of water and glycerine, to which thirty parts of potassium acetate have been added. Under this treatment the gray and white matter of the brain retain their normal difference in appearance; foci of disintegration are recognizable; hemorrhages appear red; pus in the pia mater retains its normal appearance; beautiful and true pictures are substantiated by the lungs, liver and kidneys; tubercles with central caseation present the two zones, cheesy and fresh fibrinous hepatization may be clearly differentiated; cysts of the kidney retain their natural color. The yellow tinge of the cheesy metamorphosis remains unaltered. Ulcers of the intestines, tuberculosis of the pleural cavity, red and yellow bone-marrow and muscular tissue, all retain their fresh and natural color. If the preserving fluid should become somewhat discolored during the first week, glycerine and gelatine are recommended. When the anatomical specimen has been exposed for a long time to the air it is advisable to remove a superficial layer of from 1 to 2 millimetres in thickness before placing it in the preservation fluid. An early stage of decomposition of the specimen does not interfere with the preservation and the retention of the natural color, because the greenish tint brought on by the decomposition disappears again under the influence of formalin. All the specimens have to be protected against the influence of sunlight, and are to be stored away in the dark, as only very few pigments resist the chemical influence of the sun-rays in a moist vehicle.

G. E. Roos.

A Method of Infiltrating Dental and Osseous Tissues for Microscopical Work. At a recent meeting of the Odontological Society of Great Britain, Mr. Charters White gave the details of the method he adopts to demonstrate the presence of spaces in hard sections of dental and osseous tissues. The section to be treated must be ground moderately thin, to about one thirty-second of an inch, and then immersed in absolute alcohol for five minutes, and subsequently in ether for a similar period. It is next transferred to a thin solution of celloidin (three grains of celloidin to half an ounce of equal parts of absolute alcohol and ether). This solution is colored red by the addition of fuchsin, the stain being added to the alcohol before the celloidin is dissolved. The specimen is allowed to remain in the solution for two or three days, after which it is removed and placed on paper to dry. The section is then ground to the desired tenuity and mounted on balsam. The advantages of the process are: (1) the cavernous and tubular structures in dentine and bones are filled with a colored medium, which prevents the balsam running into such spaces and so obliterating them; and (2) the section is rendered less brittle and can therefore be easily ground down without much fear of fracture.—*Lancet*, November 28, 1896.

Multiple Cysts in the Small Intestine. (*Bull. de la soc. anat. de Paris*, June–July, 1896) Letulle found in the small intestine of a man who had died of phthisis small cystic tumors, 300 to 400 in number, arising in the submucosa and apparently unconnected with the mucosa. The larger contained fluid, while the smaller contained cell-like leucocytes and giant cells with polymorphic nuclei. The latter did not contain any tubercle bacilli. There was tuberculous ulceration of the intestine, but the author does not regard these cysts as in any way connected with that process. That they were epithelial in origin is almost certain, in spite of the fact that there was no connection with the mucous membrane. The other organs most frequently attacked by cystic change—the liver, testicles and kidneys—were normal.—*British Medical Journal*, November 28, 1896.

OBSTETRICS AND GYNECOLOGY.

Three Cases of Symphysiotomy with Remarks. (*Edinburgh Medical Journal*, December, 1896.) By Archibald Donald.

In one of these cases the true conjugate of the brim measured barely 3 inches, in the others less than $3\frac{1}{4}$. The amount of separation obtained was $2\frac{3}{4}$, $2\frac{1}{2}$ and 2 inches. The incision extended from a point one inch above the upper margin of the pubes almost to the root of the clitoris. The anterior surface of the pubes was exposed, and small lateral notches were

made at their upper border to divide slightly the internal attachments of the tendons of the recti muscles, special care being taken to clear the pubic arch. The left forefinger was pushed down behind the symphysis to protect the bladder, and then the articulation was divided with a bistoury from above downwards. Sudden springing outward of the bones was prevented by pressure on the trochanters. After delivery, the bones were pushed together by the assistants, the periostium was united by medium-sized buried silk sutures, the soft tissues were brought together with silk or silk-worm gut, adhesive straps were fastened around the hips, and the patient placed in bed between sand bags. All the mothers recovered without complications; they have firm union and can walk and lift burdens as well as before. The three children were born alive though two have since died several months after birth.

L. S. SMITH.

Modern Methods of Intrauterine Medication. (*The Practitioner*, September, 1896.) By W. S. Playfair, M.D.

In addition to the commoner methods, swabbing and curetting, the author advocates the use of electricity in cases of endometritis. He recommends the application of a negative current of 80 to 100 milliamperes after the method of Apostoli. The mode of action is uncertain, but he believes it modifies the nutrition of the endometrium with its deep-seated glands. Its effect is most beneficial, five or six applications being all that are necessary in most cases. He gives three treatments in one inter-menstrual period and two or three in the next. Its drawbacks are the cost of the apparatus, the number of assistants and the time required (each application requiring not less than half an hour), but the author believes it to be a valuable therapeutic measure.

L. S. SMITH.

A Rapid Method of Preparing Stained Sections for Microscopical Diagnosis. (*Centralblatt für Gynäkologie*, October 3, 1896.) By Ludwig Pick., M.D.

This method is in use in Professor Landau's Clinic in Berlin. Sections from curetted or excised tissues are prepared for microscopical examination in from 12 to 15 minutes. They are cut with a freezing microtome, hardened in a two-per-cent. solution of formalin two or three minutes, washed in water one-half minute, stained in four per cent. solution of alum carmine three or four minutes, washed in water one minute, then in eighty per cent. alcohol for one minute, then in absolute alcohol for 10 seconds, cleared in carbol-xylol and mounted in Canada balsam.

L. S. SMITH.

The Therapeutic Use of Steam in Puerperal Endometritis. (*Centralblatt für Gynäkologie*, December 5, 1896.) By Emanuel Kahn.

The apparatus consists in a small boiler similar to that of a steam atomizer. It has a hole in the top into which a thermometer is fitted and has a pipe with a stop-cock to which the rubber tube is fastened that conducts the steam to this uterine catheter. The author gives the full clinical history of nine cases in which steam was used with very satisfactory results, although it was not tried in most of them except as a last resort. From these cases Kahn draws the conclusion that the action of steam upon the uterine cavity is: (1) without disadvantageous results and scarcely painful; (2) allays the sensitiveness of the uterus; (3) excites strong uterine contractions; (4) destroys foul smells; (5) has a direct bactericidal action, and (6) forms through occlusion of the blood and lymph channels by coagulation of the albumin a protective covering for the fresh granulation tissue beneath.

L. S. Smith.

Forceps with Adjustable Axis-Traction. (*Edinburgh Med. Journ.*, September, 1896.) By R. Milne Murray.

Accepting the Tarnier forceps as the best type for operations on the normal pelvis, Murray has modified them so that they may be adapted easily to abnormal pelves. His forceps are made entirely of steel and have a curvature of the blades seven inches in radius. "The traction rods are jointed to the blades in the usual way as near the fenestrum as possible. They then run down close to the shanks and along the backs of the handles, and at a point half way down, they turn back at a right angle for a distance of nearly four and a-half inches. The horizontal part of these rods is oval in section and the upper one is divided into distances half an inch apart which are numbered from naught to seven." The handle is applied to these horizontal rods by a block pierced to allow them to pass through it, which block can be fixed at any division on the rods by means of the pinching screw. To this block the handle is fastened by a joint that permits motion in a plane parallel to the rods. This motion is necessary to allow the handle to fall into the proper line of traction for each position on the rods. To the pin of this hinge joint is fixed a sector which moves with the handle and on whose periphery are marked the positions proper for it for each position of the block on the rods. Against one of these marks is placed the word "normal" and when the handle is adjusted to this mark the instrument is, as regards construction and efficiency, an ordinary pair of axis-traction forceps. To adapt these forceps to pelves whose inclination is less or greater than normal, the block must be shifted one or more divisions toward or away from the handle, and when the index points to the figure on the sector corresponding to the division at which the block is set, the line of traction must pass through the centers of the fenestra. For this instrument the author claims: 1. Simplicity of construction and manufacture; 2. Simplicity of parts and ease with which they may be cleaned;

3. Wide range of application. For occipito-posterior positions of the head, the author recommends a modification of the pelvic curve from one of a radius of seven inches to one of fourteen.

L. S. Smith.

Ovarian Tissue in Treatment of Climacteric Disturbances. (*Münchener Med. Wochenschrift*, No. 36, 1896.) By Dr. Mond.

Mond reports a number of cases in which the reflex nervous disturbances accompanying the menopause were improved by the administration of ovarian tissue given in the form of tablets of one and one-half grains each. After fifteen grains had been given daily for 10–12 days, the symptoms were reduced to a minimum. Patients in the natural climacterium received more immediate benefit than the others, as soon as the sixth day. The author emphasizes the importance of leaving portions of the ovary in operations on the adnexa if a hysterectomy is not performed, in the latter case the menopausal symptoms follow whether the ovaries are removed or not.

L. S. Smith.

Carcinoma of Cervix Uteri in a Girl of Fourteen. (*New Orleans Med. and Surg. Journal*, December, 1896.) By W. L. Little, M. D.

This case ended fatally one and a-half years after the patient was taken sick, and although, unfortunately, there is no record of a microscopical examination in the account of the case, the extension of the growth to the surrounding organs, the rapidly increasing constitutional debility, and the fatal termination, leave no doubt of its malignant nature and make it in all probability a carcinoma. The claim of Little that this is the youngest case on record is not substantiated, as Ganghoffer reported in the *Prag. Zeits. für Heilk.* Vol. IX., Nos. 3 and 4, a tumor of the vagina in a child of nine which proved on microscopical examination to be a carcinoma.

L. S. Smith.

A Contribution to Statistics of Labor after Antifixation of the Uterus. (*Münchener Med. Wochenschrift*, No. 46, 1896.) By W. S. Grusdew, M.D.

The 190 cases of which these are the statistics occurred in the service of Professor Werth, in the University of Kiel. 86 were treated by ventro-, ventro-vesico-, or vesico-fixation, 54 by Alexander's method, and 50 by vaginal fixation, according to Mackenrodt or Dührssen. Of the 86 cases operated on by the abdominal method, six were unmarried. Of the 80 married ones, 67 had given birth at term and 13 had had only miscarriages or had been sterile. Most of them were of long durations, 35 had adhesions, 47 had none, but in only 12 was the retro-

version unaccompanied by other diseases of the genital organs. Of the 86 operations, three were ventro-fixations alone, 16 vesico-fixations and 66 combinations of these two methods. Care was taken not to cause too firm fibrous union between the uterus and the abdominal wall. In this group the result was followed up in 50 cases without finding any recurrence of the displacement. Pregnancy occurred in four cases. Two were delivered normally 16½ months and 23 months, respectively, after operation. Two conceived seven and a-half and eight months after the operation, and have not yet been delivered, but the pregnancies are normal so far. Of the 54 cases operated upon by Alexander's method, four were unmarried. Of the 50 married ones, 43 had borne children, while seven had been sterile. Only three were new cases, the others being of long standing; two had slight adhesions which were loosened by Schultz's method. In 52 the uteri were freely movable. Results followed up in 41 cases showed two recurrences. Conception followed in 15 of the cases, resulting in 16 normal labors, two forceps deliveries (one child dead), and five miscarriages—23 conceptions in all. One patient had a partial recurrence after labor. Of the 50 cases treated by vaginal-fixation, 49 were married women, of whom 43 had borne children and six either had been sterile or had aborted. In 48 cases the uterus was movable, in seven cases the retroflexion was uncomplicated by other diseases. Only 11 cases were comparatively recent. Twenty-nine were operated upon by Mackenrodt's method and 21 by Dührssen's method (opening the peritoneum). In all of them not the fundus uteri itself, but merely the upper part of the anterior uterine wall, was fastened to the vagina. Of the 32 patients in whom the results could be followed up, 17 had been operated upon according to Mackenrodt and 15 according to Dührssen. A recurrence took place five times (once after labor) in the former and once in the latter. Conception occurred four times—three after Mackenrodt's and one after Dührssen's method. These four resulted in three spontaneous deliveries and one abortion. In all, conception occurred 31 times after antifixation, in many cases after quite a long period of sterility. The four occurring after ventro-fixation ran a normal course with little pain. The 23 pregnancies following Alexander's operation resulted in two abortions, three premature labors and 18 deliveries at term (two with forceps). Some of the patients had pain in the cicatrices but no dystochia occurred which could be attributed to the artificial relations produced by the operation. One recurrence of the retroposition, and that only to a slight degree, was observed after labor and it was caused by a prolapsed vagina. The three pregnancies following Mackenrodt's operation were perfectly normal and none of the disturbances noted by Strassman (*Arch. f. Gyn.*, 1896, Bd. 4), Graefe (*Monatschrift f. Geburt, u. Gynäk.*, December, 1885), or Wertheim (*Centralblatt f. Gynäkologie*, January 11, 1896) were observed. In one case a recurrence followed the labor. The patient oper-

ated on by Dührssen's method had a recurrence of the retroposition in the second month and aborted. As regards the relative values of the different methods of operation, the author concludes that in none of them need disturbances of gestation be feared if the operation has been performed with due regard to the possibility of future conception, care being taken to avoid too firm adhesions which will prevent the symmetrical enlargement of the uterus. The advantages lie with Professor Werth's ventro-vesico fixation, but being a very severe operation, it is to be used only in cases in which the uterus is firmly fixed or, at the most, only slightly movable, or in cases requiring operative interference on account of diseases of the appendages. The Alexander's operation remains the most rational for movable and uncomplicated retroflexions. After it one may be quite unconcerned about the course of a gestation. Its technical difficulties are easily overcome through practice, and should not deter anyone with any operative skill from attempting it. In certainty of result and in freedom from danger it surpasses all others, but the fact that it is applicable only to the retro-displacements free from adhesions and unaccompanied with disease of the adnexa makes its indications narrower than those of either ventro- or vaginal fixation.

L. S. Smith.

MISCELLANEOUS.

Annus Medicus, 1896.—An admirable review of the progress of medicine and cognate sciences during the past year will be found in the *Lancet* for December 26, 1896. While a local coloring is given to the account, it should be read in its entirety by every student who desires to keep abreast with the constantly increasing scientific work of the many zealous investigators throughout the civilized world.

Medicine.—A review of the year reveals no specially pre-eminent researches, though much effective work has been done along the border lines of medicine and bacteriology, if indeed the two should be separated. In the field of tuberculosis, the question of meat obtained from tuberculous animals has received wide attention, and Dr. Sidney Martin is of the opinion that the carcass should be rejected if a generalization of the disease is indicated, and should be passed in cases where the disease is limited to one cavity or organ, such as the pleura, mesenteric glands, or liver alone. Tuberculous milk should be divided into two classes—that from cows subject to the disease in the internal organs, minus the udder; and that from cows with the disease in both localities. In the latter case the cows should be slaughtered. The Royal Commission on Vaccination have differed as to the advisability of compulsory vaccination, though their labors of some years have vindicated the discovery of Jenner in this, its centennial year. In

skin-diseases the result of the elaborate discussion at the third International Congress on Dermatology of ringworm and trycophytons, shows a general agreement that many of the large-spored varieties are of animal origin. The paper by Hutchinson on the period of contagion of syphilis was a valuable contribution. The Gulstonian lectures of Dr. Patrick Manson treat most exhaustively the subject of the parasite of malaria, the conclusion being that this parasite comes from without, though the effort to find the germ by searching external nature has proved ineffectual. Dr. Manson concludes that the crescent body and the tertian and quartan spherical bodies which advance to flagellation are the extra-corporeal sporulating homologues of the intra-corporeal spore. One is the germ of the plasmodium inside the human body; the other the germ of the plasmodium outside. While the contributions of Marshall and Thin to our knowledge of this parasite are valuable and instructive, the proposition that there are as many varieties of parasites as varieties of fever seems to fail of positive demonstration. The serum therapeutics of disease still attract much attention and investigation. The antitoxin treatment of diphtheria has fully justified the first hopes entertained for it. It is established that those cases showing the best results yield on cultivation a pure growth of the Klebs-Löffler bacillus. The investigation by Hewlett and Nolan of one thousand cases of suspected diphtheria has emphasized the desirability of bacteriological examination in all cases of doubtful throat-symptoms, and also points to the prevalence of the virulent bacteria in the throat for weeks after convalescence. An anti-streptococcic serum has been used with success in some cases of septicemia. Observations on the serum reaction in typhoid fever show difficulties in the way of its extensive use. The serum treatment of tuberculosis and syphilis has not become firmly established. Snake-bite has elicited some attention by Calmette and Fraser, and has been successfully treated with antivenin. It has been shown that with this substance human life may be saved in a large proportion of cases. The Nauheim treatment of heart-diseases has been widely discussed; this includes the Nauheim baths and Dr. Schott's exercises. The opinion seems general that in the Nauheim treatment we have a valuable addition to cardiac therapeutics. The tendency, however, is to over-estimate its power. Little has been evolved with regard to nervous diseases. The most important medical publication of the year is undoubtedly Dr. Clifford Allbutt's System of Medicine. The American publication, "The Twentieth Century of Medicine," is highly commended as an excellent and important work.

Surgery.—Few advances of any great moment have been recorded during the year in surgery. Abdominal surgery is steadily becoming more extensive and more simple, the most striking evidence of this perhaps being the new operation for dilating the stomach by Mr. W. H. Bennett. The medicinal treatment of non-obstructive dilatation of the stomach, when

well marked, can hardly be considered satisfactory, as many patients are unable to perform the daily washings out of that organ. Mr. Bennett adopted in one of his cases a median vertical incision through the abdominal wall, and the drawing out of the stomach; then a fold of the anterior wall was turned in by an assistant, this portion being twelve inches in length and six in breadth; the edges were stitched together, involving however only the peritoneal and muscular coats. The capacity of the stomach was thus much diminished. Though much collapse attended the operation, the patient soon improved and took nourishment without inconvenience; the bowels acted freely. This operation is advised for extreme cases of dilatation, where the treatment by the stomach "toilet" is impracticable. The employment of Murphy's button in uniting the portions of intestine after resection and gastro-enterostomy prevails to a very great extent, and a number of cases are reported where the button has been retained for a long time without harmful results. Mr. J. Jackson Clarke has devised a "bobbin" in which rubber rings are used to hold the bowel on to the core of the bobbin; the edges of the rings are thought to thus give less chance of sloughing than the metal edges of a Murphy's button. Loreta's mechanical dilatation of a simple stricture of the pylorus has quietly dropped out of use, and has been replaced by pyloroplasty, which promises to become the specific treatment for fibrous stenosis of the pylorus. Of late years the trans-peritoneal method has been used in ligating the iliac arteries, in place of the old extra-peritoneal procedure, which was always dangerous, especially when used in cases of aneurysm, the dilated vessel being often adherent to the peritoneum. But even with this method only two instances of successful performance are believed to have been recorded.

Prostatectomy by the suprapubic operation (McGill's) in cases of difficult micturition, as a substitute for catheterism, is a much more convenient operation. Castration, as performed first by Ramm, of Christiana, and then by White, of Philadelphia, causes atrophy of the enlarged gland, and has given very good results, perfect control over the bladder being frequently obtained; but in not a few cases fatal consequences have occurred, doubtless due to renal complications. Mr. Reginald Harrison has advised for this purpose division or ligature of one or both vasa deferentia. Extension of the surgery of the kidney has been suggested by some authorities to cases where albuminuria results from congestion; in these cases it has been thought that punctures or incisions would at least relieve pain and cause increased secretion of urine. Renewed attention has been drawn by Morton's metatarsal neuralgia. It is not rare, and is apparently due to pressure on a digital nerve by the head of the metatarsal bone.

Obstetrics and Gynecology.—In obstetrical matters the year has been one of unusual activity. Professor Curatulo of the Royal University of Rome, in a paper on the "Influence of the removal of the ovaries on

metabolism in connection with osteomalacia," suggests that as the ovaries probably produce a secretion capable of increasing the oxidation of phosphorus in the bones, the removal of the ovaries withdraws this secretion, tends to diminish the oxidation, and thus facilitates the accumulation of earthy salts in the bones. In a paper on the "Effects of lactation on menstruation and impregnation," Dr. Remfry concludes that 57% of suckling women have absolute amenorrhea, a less number menstruate more or less, while probably 20% menstruate quite regularly. If amenorrhœa exists during lactation the chance of pregnancy is very small, while in women who menstruate regularly the chances are about 10% greater. In the Obstetrical Society of London a discussion on a paper by Mr. Harrison Crepps showed that the extra-peritoneal method of treating the stump after abdominal hysterectomy still had its advocates. A case was reported by Lewers of a girl 17 years of age with double uterus, with double hematometra, and complete absence of the vagina. No precisely similar case appears to be recorded. Operations during the year for fixation of the uterus have been done for the various degrees of retroversion and retroflexion and for uterine prolapse. Two operations have obtained prominence, *viz.*, one in which, after abdominal section, the uterus is attached more or less closely to the anterior abdominal wall; in the other class, an opening is made into the utero-vesical pouch of the peritoneum through the anterior vaginal fornix, and the body of the retroflexed or retroverted uterus is drawn up to the opening and fastened there in a position of anteversion. This is the so-called vaginal fixation of the uterus. The results of this latter operation, according to Noble, have been as a rule disastrous; it has been the cause of abortion in one-fourth of the cases in which pregnancy has occurred after the operation and of serious complications in other cases. He therefore regards the operation, as an unjustifiable one in women during the child-bearing period of life. The surgical treatment of uterine fibroids has engaged wide attention among gynecologists. Uniform agreement has not yet however been reached in regard to the best method for removing a uterus enlarged by fibroid tumors. Many advocate the extra-peritoneal treatment of the pedicle, backed by their long experience of it. These belong to the conservative school, while many of a more progressive tendency favor some method which permits the operator to drop the pedicle back into the peritoneal cavity and close the wound. The comparison however seems at present to be hardly a fair one, the intra-peritoneal treatment being quite a recent thing. Baer's operation may be considered the type of this class, and it has only been practiced in England some five years.

Therapeutics.—The patient researches connected with the various varieties of serum overshadow to a large degree the other forms of work. Many and valuable papers have been published concerning the antitoxic

serum for diphtheria. The medical superintendents of the Metropolitan Asylums Board consider that this serum possesses greater value than any other known form of treatment, and are cautious in their endeavor to speak with impartiality. Tetanus antitoxin does not appear to have given as much satisfaction. In isolated cases it would seem to have contributed to the recovery of patients. One of the most important discussions during the year has been that regarding the question of the absorption of iron. Dr. Leech maintains that the balance of evidence favors the theory that iron is absorbed by the small intestine, or at least by the duodenum, that it is stored up in the liver and spleen, and is utilized in the formation of hemoglobin. Many experiments appear to indicate that charcoal, whether dry or mixed, is a powerful oxidizing agent, which will probably be of use in cases of undue decomposition of the contents of the alimentary canal. Tannaform, a condensation product of tannin and formic aldehyde, has been suggested as a non-irritating astringent and intestinal antiseptic. Tannalbin is likewise slowly soluble in the intestine, though insoluble in the stomach; it has been used in subacute or chronic intestinal catarrh. A compound of tannin and diacetyl, named tannigen, has also been introduced on account of its insolubility in water or acids, and its power of breaking up readily in an alkaline medium. The diuretic influence of theobromine has been maintained by the *Société de Thérapeutique* as being superior to diuretin, the sodium salicylate of theobromine. Cocaine as a local anesthetic has been challenged by the introduction of eucaine, which is claimed to be equally efficacious and less toxic, having no effect upon the pupils. Among new antiseptics are noticed salacetol, izal, traumatol, and formaldehyde. Europhen has been put forward as a substitute for iodoform, being both non-irritating and non-toxic. Attention has also been called to picric acid for the treatment of burns, formalin gelatin as a local application to resist acids and alkalies, and celloidin as a permanent dry coating for wounds. The year has been deficient in antipyretics, greater stress being laid upon other methods of reducing temperature. Improved methods of administering quinine have been suggested. Garrod considers that he has firmly established that guiacum is a prophylactic against gout.

Opthalmology.—Frost's Atlas, Knopp's translations of Oeller's work, Knies on the "Relation of the Eye to General Diseases" and "System of Diseases of the Eye," planned by Norris, [and Oliver] are the important works of the year in this branch of medicine. Professor Uhthoff has devised a simple instrument for keratoscopy, consisting of the usual arc of an ophthalmometer, on which alternate black and white lines are drawn from end to end; the reflection of these from the cornea, when illuminated, by their separation or approximation demonstrates the position and, to some extent, the degree of irregular prominence or flattening of the cornea. Dr.

Pfinget has made careful observations at different periods of the degree of astigmatism following operations for cataract. He shows that while large at first, it soon diminishes and almost disappears in a few weeks, slow improvement continuing for some months. It is to be noted that, according to Dr. F. W. Ellis, persistent closure of the eye in using the microscope may produce irregular astigmatism, which, though at first temporary, occasionally becomes permanent. In such usage both eyes should be kept open. In high and increasing myopia, the removal of the transparent lens seems sometimes to be a justifiable operation. S. Ramon y Cajal has made extensive research into the histology of the retina. He describes, with drawings, the wonderful complexity of the outrunners or dendrites of the several layers, thus supporting his well-known views in regard to the free termination of such processes. Dr. Lindsay Johnson believes that he has established that certain zones may be differentiated in the retina of man and the primates, a discovery which, if further substantiated, may lead to the clearing up of some pathological lesions at present needing explanation. Among the new remedies proposed or used have been eucaine, fluoride of sodium or fluorol, formalin, ichthyol, nosophen and ethyl diamine as antiseptics; bromohydrate of arecoline as a myotic and mydrol as a mydriatic.

Forensic Medicine.—The case of Kitson *vs.* Playfair is too recent and well-known to bear repetition. A long list of criminal abortions have been reported during the year, an offence which is still prevalent in spite of exemplary punishments. The case of Dr. Cullingworth, who performed in his discretion, without regard to the wishes of his patient, the operation of double oöphorectomy, exphasizes the advisability of securing from patients written rather than verbal permissions, especially in cases where the nature and extent of the operative procedure can only be ascertained when the patient is under an anesthetic. The case is recorded of a woman whose declaration on what was supposed to be her death bed was thrown out of court because she made use of the words, "I might get better; I mean to have a good try." The court refused it as a dying declaration, though accepting her evidence as against those who performed the abortion, and pronouncing sentence accordingly.

Anesthesia.—Reviewing the points of interest in regard to the subject of anesthesia, mention is made of the recent jubilee of the discovery in Boston, honor being given to Morton and Jackson as its discoverers. Next in importance to this discovery is the attempt to evolve safer methods and a more precise knowledge of the methods employed. By the death of Benjamin Ward Richardson, the world has lost one who did great service in this direction. He had hoped to find in methylen the ideal remedy, and it was no fault of his if further experiments rendered it probable that it was no better than its predecessors. Ether spray, though used by

Richardson for capital operations, has not attained a lasting success, save in minor operations. Leonard Hill's conclusions in regard to the influence of posture on the functions of life are important in this question. He shows that under chloroform the influence of gravity is of vital importance. In circulatory failure he recommends gradual elevation of the feet and trunk about the level of the head and bandaging the abdomen. Dudley Buxton has found that under chloroform, ether, and nitrous oxide, destruction of blood corpuscles occurs, though nerve-shock, hemorrhage, posture, *etc.*, influence the result. Marthen has offered some instructive details regarding the cause of death under and after chloroform. He states that an acute fatty degeneration of the parenchymatous viscera follows chloroform, as it does phosphorus. In human beings the kidneys suffer most, while in dogs it is the heart. Fränkel records three cases out of five deaths in which the heart-muscle was broken up. Friedländer asserts that albuminuria occurs commonly after chloroform. He believes the loss of oxygen in the blood, destruction of corpuscles, and presence of free chlorine in the tissues from splitting up of the chloroform, occasions the renal destruction. This opinion is confirmed by Eisendraht. Schleich's infiltration plan of local anesthetization has received much support, and many papers have been published on the subject. While other anesthetics have received but little notice, Hennicke's work with Dreser would seem to increase our knowledge of the action of the bromide of ethyl, demonstrating that it undergoes decomposition in the tissues.

Röntgen's Discovery.—It goes without saying that the most important advance during the year 1896 in the whole domain of medicine and surgery is the discovery of the X-rays. The process has been so often described that but few words need be said regarding it, except to recall the fact that in 1868 Sir Benjamin W. Richardson succeeded in devising a method of seeing fairly the shapes of bones in the hand, though no practical use was made of his invention. The immense field of applicability of this discovery in medicine and surgery will occur to every one. We possess no power of refracting the X-rays, and are therefore unable to obtain a "true image," the pictures being nothing more than photographic prints of shadows. It is however supposable that this difficulty will at no distant day be overcome. The discovery is of less value in medicine than in surgery, though dilatation of the right side of the heart can be recognized, as also atheroma of the aorta and aneurysms. The *Lancet* says Röntgen pictures are now called skiagraphs.

CATTELL.

BOOK REVIEWS.

RÉSULTATS DE L'EXAMEN DE DIX MILLE OBSERVATIONS DE HERNIES, par Paul Berger, Professeur de clinique chirurgicale à la Faculté de Médicine de Paris, Membre de l'Académie de Mêdecine, Chirurgien de l'hôpital de la Pitié. 1 vol. in-8°, 4 fr. Felix Alcan, éditeur.

Professor Berger presented this important communication on hernias at the last Congress of French Surgeons, it being the result of the numerous observations which he had made during four years at the Central Bureau of Hospitals in Paris. They comprise the most extensive statistics on this subject yet published, and are the result of absolutely personal examinations, since every patient alluded to in the report was examined by the author himself, and every peculiarity studied by him.

The work is divided into four parts: in the first the author discusses the frequency of hernia in the two sexes; in the second he studies the relationship between hernia and the various ages; the third he devotes to a discussion of causes and influences operating to produce hernias, and in the fourth he reviews the complications and accidents which may happen to a rupture.

All of these considerations naturally lead him to certain conclusions concerning the dangers to which ruptured patients are exposed, and certain deductions concerning the indications for radical operations. Lastly he adverts to the differences between the reports of time past and his own studies, shows how contradictions have arisen, clearly points out the reasons for the same, and reconciles many apparently wide differences between authors past and present. The work is an exceedingly valuable one and deserves careful reading by all who are deeply interested in the study of rupture.

R. P.

A TEXT-BOOK UPON THE PATHOGENIC BACTERIA FOR STUDENTS OF MEDICINE AND PHYSICIANS. By Joseph McFarland, M. D., Demonstrator of Pathological Histology and Lecturer on Bacteriology in the Medical Department of the University of Pennsylvania. With 113 illustrations. W. B. Saunders, Philadelphia, 1896.

While we would search in vain for a reason why it was necessary to place upon the market another work on bacteria, we must nevertheless acknowledge that the one before us will serve well its alleged purpose as a text-book. The author has marked out his limits with care, and adhered fairly well to them, in that he has confined himself quite closely to considering pathogenic bacteria, and has not permitted himself to be discursive on the subject of allied non-pathogenic forms. Thus all the sarcinæ are omitted; the only apparent contradiction in the work, in this respect, being the addition of a description of certain spirilla which are similar to and closely allied with those of cholera, although they have not been assigned a definite *rôle*.

The avowed intent to make this book a text-book must disarm criticism so far as the admission of certain formulæ and descriptions are concerned. A short historical introduction, perhaps too short, appropriately opens the work, after which the morphology and biology of bacteria are briefly considered. From a

clinical standpoint the division of pathogenic bacteria into septic, phlogistic and toxic may be admissible, but is one of questionable value and only occasionally useful. Immunity and susceptibility receive fair consideration as they ought in such a work. The chapters on methods are succinct and should be useful.

Part II. deals with specific diseases and their bacteria, and takes up two hundred pages. The writer opens it with the consideration of phlogistic diseases, among which he considers suppuration first. Under this head he says most of what little he has to say about surgical sepsis, with which as a topic he deals most unsatisfactorily. Surely septicæmia and its allied diseases deserve as much place in such a work as does the formation of pus; the meager statements that one may find with reference to it are altogether too widely separated through the work, and a student might in vain turn to it for such information as he should possess.

The writer has also failed to accept the generally accepted teaching that Passet's *Bacillus pyogenes fœtidus* is identical with the colon-bacillus, which latter he takes up distinctly in two or three different places.

Tuberculosis is considered as a chronic disease, along with leprosy, glanders, actinomycosis, and rhinoscleroma; while diphtheria, tetanus, typhoid, hydrophobia, cholera, and pneumonia are discussed among the toxic diseases. Lastly, and to our surprise, among the septic diseases are together mentioned relapsing fever, influenza, measles, malignant edema, and anthrax, along with some others. With all this classification, which is certainly peculiar to the author, the reviewer has no sympathy and but little patience, since it seems to him inexcusably bad. With the statements regarding each disease, however, we can find but little fault, some of the remarks being quite happy.

Altogether while the book is presentable and certainly useful as a manual we fail to see evidences of anything more than compilation, for the most part, however, well done; and a, generally speaking, acceptable use of illustrations which have done duty in numerous previous works or instrument catalogues.

R. P.

Diseases of the Stomach. A Text-Book for Practitioners and Students. By Max Einhorn, M.D. New York, William Wood & Co., 1896.

New books on diseases of the digestive system have been appearing of late in rapid succession in Germany and France. In 1895 Sidney Martin, of England, wrote the first systematic work on the subject in English, and now Einhorn is the first in America to enter the same field with a separate scientific treatise. These two books fill a real want, since Ewald's elaborate and admirable work, which appeared three years ago in English dress, no longer represents the latest knowledge in all the parts of this large special domain. Boas' unsurpassed work is not accessible except to those familiar with the German language. The same may be said of numerous other German books on this subject published in 1896, including Riegel's and Fleiner's monographs, Fleischer's comprehensive system of medicine largely devoted to diseases of the digestive organs, as well as the volume on the treatment of diseases of the same tract by Penzoldt and others in the series entitled, *Handbuch der spec. Ther. innerer Krankheiten.*

The multiplicity of works now appearing in this new specialty shows at least an extraordinary activity on the part of those engaged in it, and indicates that probably the time is not far distant when the profession generally will recognize the fact that special training and skill are not more necessary to save a threatened hearing or eyesight, than to halt the march of insidious disease in the equally intricate digestive apparatus without which life itself is impossible.

Einhorn's work, while smaller and less pretentious than most of those just mentioned, is in many respects not inferior to a number of them. It is avowedly intended for practitioners and students, rather than to be a guide for specialists, and yet by the aid of an unusual terseness of expression without sacrifice of clearness, the author has managed to condense into it quite a complete and satisfactory account of the maladies pertaining to that limited part of the digestive system which he has chosen as his subject. And it has long since become impossible to consider adequately in one volume, however large, all the diseases of all the parts of this system, including the salivary glands, esophagus, stomach, liver, pancreas, and the various divisions and appendages of the intestinal tube. Our author's instructions concerning the methods of examination of patients are in the main clear and explicit, though they would have been more useful to most of the readers for whom they were intended, if less space had been devoted to detailed accounts and illustrations of complicated instruments requiring much skill and training to manipulate, and more had been assigned to an elaboration of the external methods of interrogating the abdominal organs, including especially the procedures for ascertaining the boundaries of the stomach by clapotage and percussion with the patient in various positions, before and after causing him to drink a quantity of fluid. Complete directions as to these methods based upon the contributions of Dehio, Traube, Jaschtschenko, Obrastrow, Boas, and some recent American writers, would render it practicable for any adept in percussion to determine the location of the lesser and greater curvatures of the stomach, in at least a large majority of cases without the aid of even a tube, and, by an extension of the same procedures, to obtain valuable information, as well concerning the propulsive power of the stomach.

That part of the book describing the various chemical tests for the stomach contents, though very concise, is accurate, and well up to date. A physician well grounded in chemistry must find it helpful to him in prosecuting special studies in this important field.

The chapters on ulcer, erosions of the stomach, and cancer are particularly good for a work of this scope, leaving little to be desired. That on Glenard's disease is a distinct improvement over anything that has appeared on the subject in English. The great frequency and possible seriousness of the displacements of the stomach, intestines, and kidneys will probably be a surprise to many physicians in this country. In this connection the author might well have referred to the remarkable papers of Meinert, of Dresden, in which he goes far toward establishing a causal relation between these displacements and chlorosis.

The account of hyperchlorhydria is also more complete and satisfactory than the references to it in any other book published so far in English, except, possibly, Mathieu's; but the statistics cited from the author's own practice would have been far more valuable if they had been based on quantitative estimations of the amount of free hydrochloric acid present in each case by at least one of the simpler methods, such as that of Mintz.

The author does not recognize anywhere in his book the fact demonstrated by Jaworski, Boas, Hayem, Turck, and others, that an excess of hydrochloric acid may co-exist with a true catarrhal inflammation ; in other words, that there may be an acid gastric catarrh. This is a discovery of much practical clinical importance. The sections on nervous diseases of the stomach are exceptionally full and must prove useful to every practitioner.

The mechanical execution of the book is most excellent. It makes a handsome, attractive volume, and speaking generally it is one which every physician will be the better for having read.

B. R.

ITEMS OF INTEREST.

Unconscious Delivery of a Twin-child.

THERE came last year by train to Philadelphia a hard-working colored woman who was five months pregnant. Feeling her labor-pains coming on she took a cab at the Broad street station, and was driven to one of our large hospitals, where she was duly delivered of a dead child. The cabman returned to his post, seeking for more work. A lady engaged his services, and just as the coach started she opened the door with a bang, jumped to the ground, and disappeared to parts unknown. On further investigation a five-months' colored child was found on the floor of the carriage. At the coroner's inquest the mother swore that she was not aware that she had given birth to the child while on the way to the hospital, and that no abortion had been performed upon her person. She considered the premature labor as being due to hard work.

CATTELL.

A Case of Criminal Negligence on the part of a Midwife.

THE following interesting case is reported in the *Australasian Medical Gazette*: A Mrs. D. was attended in her confinement by one Margaret Grainger, a midwife of some thirty years' experience. The child was born without difficulty on May 23, 1896, but the placenta not coming away, Grainger proceeded to remove it by pulling on the cord. The tugging dragged down and inverted the uterus, which was then mistaken by the midwife for the afterbirth. Grainger now asked Mrs. D. to blow on the back of her hand until she got the afterbirth away. Mrs. D. did so for a time, and then exclaimed: "Please let me have a little rest, for I'm quite done up." She let her have a few minutes' rest, and then told her to blow on her hand again. Mrs. D. asked for a drink, as she felt sick and faint. The midwife gave her vinegar and water. The patient again tried to blow on her hand, when she fell back and died. A medical examination revealed the fact that the inverted uterus had been torn away from the body of the unfortunate woman, and that death had resulted from the consequent hemorrhage and shock. Grainger was tried for manslaughter at Rockhampton before Mr. Justice Power, and was found guilty on September 15th.

In addressing the prisoner his Honor made use of the following words: "You represented yourself as a midwife, and you were employed as one, and the evidence in the case—the most painful that has ever come before any of the courts in Queensland within my experience—shows you displayed the grossest ignorance and unskilfulness in the performance of your

duties, whatever the cause may have been. The result of that unskilfulness and ignorance on your part was to cause the death, within a short period of this unfortunate young woman—a woman in the enjoyment of perfect health and in the twenty-sixth year of her age. I have had a great deal of experience, considering my age, in the criminal courts of this colony—and, in endeavouring to assist the jury to come to a just conclusion in your case, I think I read almost every recorded case that bears any similarity to yours—and I have no hesitation in saying no more dreadful or more horrible case can be found in the annals of this colony [Queensland], or, as far as I have been able to ascertain, in any of the recorded cases. I do not propose to add to the painfulness of your position by again detailing, as I had to do to the jury, the circumstances of this terrible tragedy in which you were the chief actor. I have taken time to consider what sentence I shall inflict upon you. I have taken into account your age, and I have also again considered the whole circumstances of the case; and I regret to say I can see no redeeming feature whatever in it. I must therefore, in the exercise of my functions, inflict what, to a woman of your age, is a severe sentence; but, at the same time, it is not by any means as heavy a sentence as I should have imposed under the terrible circumstances if you were a young woman. The sentence of the Court is that you be kept to penal servitude in Toowoomba Gaol for five years."

Can any of our readers supply us with an analogous case? It is interesting to speculate as to what would have been the outcome of the trial had the patient been attended by a registered physician under similar circumstances.

CATTELL.

Poisoning by Illuminating Gas.

THERE seems to have been recently in Philadelphia an epidemic of accidental and suicidal deaths from illuminating gas. During 1896 the Coroner held inquests on 33 cases in which death was determined to have been directly due to this cause. It is often impossible to state positively whether the act has been premeditated, but one-half of the cases reported would seem to be intentional. One of the methods employed by the would-be suicide is to close tightly the windows and doors and connect the gas-jet with the mouth by means of rubber tubing, often attaching to the end for this purpose an ordinary smoking pipe. Death is quick and, like in the French method of suicide by charcoal, practically painless. It seems almost certain that there are fashions in suicide as in anything else, and that the recent accounts in the daily papers have had much to do with the diffusion of knowledge in regard to this method of ending life. Several years ago death from arsenical poisoning by the use of "Rough-on-Rats" was much commoner than it is now. The reason for this is that it has become known that by this means of ending life considerable suffering occurs

previous to death. Water-gas is largely used in Philadelphia, and death in these cases is due to poisoning by carbon monoxide, as it forms one-third of the volume of this variety of illuminating gas. The uniform rosy hue of the serous membrane of the small intestines is one of the most striking features at the autopsy. The odor of the other gases inhaled at the same time as the carbon monoxide is often incapable of recognition at that time. The best test is that of the spectroscope. It is stated in the daily papers that a bill is to be introduced into the present Legislature of Pennsylvania to use carbon monoxide for executing criminals condemned to death. The person to be carbonoxided is to be kept in ignorance of the date of execution, while the gas is to be given to the patient by turning it on noiselessly in a specially prepared room. While there might be but a small amount of physical suffering, the mental torture of the uncertainty of the date of death would be terrible.

CATTELL.

Neale's Medical Digest.

EVERY one who has done much medical writing knows full well the great value to be secured from the use of the *Index Catalogue* and the *Index Medicus*. Few, however, either consult or even know of *Neale's Medical Digest* or *Busy Practitioner's Vade-mecum*, published by Ledger, Smith & Co., of London. The third edition of this work includes references to the literature of the English medical journals from 1840–90, and the recently-issued appendix supplements them down to August, 1895. A full index of subjects is placed at the end of the work, and by searching this a section and division number is obtained, which when found in the front of the book gives you references to literature upon the subject matter desired.

CATTELL.

NOTE TO CONTRIBUTORS.

AUTHORS will receive liberal compensation for all accepted articles after publication; or 250 reprints, if asked for on the manuscript, will be furnished in lieu of the honorarium. It is distinctly understood that all articles appearing as original matter are for our exclusive use, and are not to be reprinted or to appear in any other publication excepting the Transactions of the Society before which the paper may have been read. Illustrated papers are especially desired.

All matters of business, as well as subscriptions, should be sent to the INTERNATIONAL MEDICAL MAGAZINE COMPANY, 3709 Spruce Street, Philadelphia.

Manuscripts, exchanges, and books for review should be addressed to the Editorial Office, 3709 Spruce Street, Philadelphia.

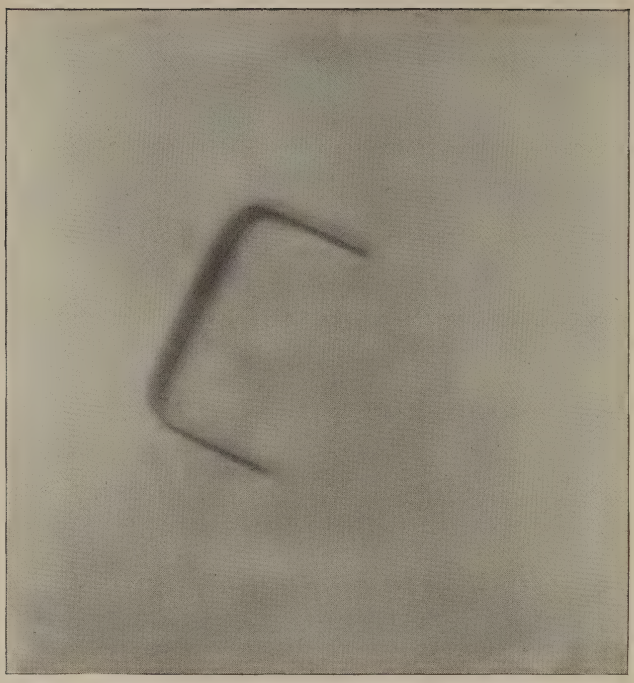


FIG. 1.—Skiagraph of staple in the esophagus; antero-posterior view.

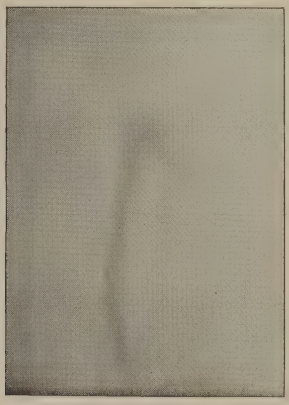


FIG. 2.—Skiagraph of staple in the esophagus; lateral view.

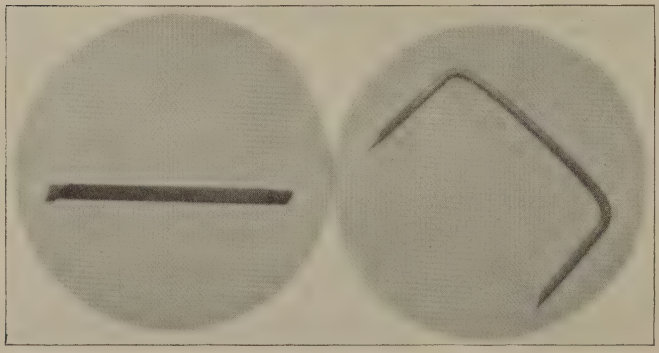


FIG. 3.—Lateral and antero-posterior view of the staple. (Natural size; photograph.)

INTERNATIONAL
MEDICAL MAGAZINE.

Vol. VI.] MARCH, 1897. [No. 2.

ORIGINAL COMMUNICATIONS.

FOREIGN BODY (IRON STAPLE) IN THE ESOPHAGUS, REMOVED AFTER HAVING BEEN LOCATED BY MEANS OF THE RÖNTGEN RAYS.

BY ARTHUR AMES BLISS, A.M., M.D.,

Laryngologist to the German Hospital; Laryngologist and Aurist to the Pennsylvania Institution for the Deaf; Fellow of the American Laryngological Association and of the College of Physicians of Philadelphia, etc.

THE numerous instances in which foreign bodies have found lodgement in the esophagus present a long list of substances thus impacted. I have not, however, found any mention of a foreign body similar to the one extracted in the case I am about to report.

The patient is a gentleman, sixty-nine years of age. Owing to the disappearance of most of his molar teeth, and, as he does not use an artificial set, he is accustomed to swallow his food after very slight, if any, mastication.

On December 16th, 1896, while eating a piece of mince pie, he was conscious for a moment of a hard substance in his mouth, which passed instantly into the lower pharynx and became fixed at the entrance of the esophagus. Pain was extremely severe, as the patient says "agonizing." It radiated from the seat of fixation outwards and upwards along both sides of the neck, and appeared to be caused by two sharp points which stabbed into the tissues with each attempt at deglutition. This pain, although greatly lessened in intensity, remained the same in location and character until the foreign body was removed, two weeks later. I saw the patient on the evening of December 16th. All the normal contour of the arytenoid cartilages and ary-epiglottic folds was lost and the area presented a confused mass of edematous tissue which obscured the view into the larynx. Dyspnea was slight, although distressing when any attempt was made to probe into the edematous area, even after the free use of cocaine. The voice was husky and weak and interrupted by severe paroxysms of coughing. An enormous quantity of thick, ropy, clear-colored mucus welled up from the esophageal region of the laryngo-pharynx, and blood oozed

from the region back of the larnyx. The laryngeal mirror failed to reveal any foreign body in the patient's throat and palpation with the finger was equally ineffective. I proposed a tracheotomy, as the conditions suggested great danger of closure of the larnyx from any slight increase of the edema. The patient objected to this procedure, but preparations were made for its performance if serious dyspnea was threatened.

During a period of two weeks the appearance of the throat gradually improved; the edema disappeared, pain became greatly lessened. The patient at first fed upon milk, was able, later, to take a full diet of soft food, hashed meats, eggs, etc. Any great effort at gagging was followed by considerable bleeding from the region back of the larnyx.

About the tenth day after the accident, the laryngeal mirror showed, for the first time, a small rounded substance which appeared behind the right arytenoid when the patient phonated E strongly and in high pitch. The object resembled the elbow or right-angled curve of a piece of heavy wire, bent as described. I passed a blunt hook beneath and around it and found that it was firmly fastened in the walls of the esophagus. By means of a blunt probe, two arms could be felt, projecting from the presenting angle, the right extending downwards and outwards for about one inch, the left, crossing transversely back of the right arytenoid and appearing to be buried in the interarytenoid space. The whole object rose and fell with the corresponding movements of the larnyx. It was readily grasped by Cuscoe's laryngeal forceps, but all the force I could use failed to lift it from its place of attachment.

The advisability of performing esophagotomy was considered, but I determined to await the result of examination by the Röntgen rays. The skiagraphs (see Figs. 1 and 2) were made by Dr. M. J. Stern. The object was supposed to be the frame of a buckle. It will be noted that it lies about in front of the fourth cervical vertebra, diagonally across the esophagus and mainly to the right of the median line. Knowing the shape and position of the object as shown by a drawing sent to me, I was able, on the following day, to remove the foreign body from the patient's throat by means of Cuscoe's laryngeal forceps. It proved to be a meat tag of unusually large size, as shown by the accompanying photograph (see Fig. 3). The two ends are extremely sharp and ragged. They were firmly attached to the anterior wall of the esophagus at its entrance, behind the arytenoid and cricoid cartilages. The staple is one inch long; the short arms, about one-half inch in length. The staple is used for fastening cards of address, etc., to pieces of meat. Its presence in a piece of mince pie is thus explained.

I have learned of two other instances in which meat tags, or staples, were swallowed. These cases occurred in the practice of Dr. William R. D. Blackwood, of this city. In one case the staple lodged in the soft palate; in the other case in one of the faucial tonsils.

My case illustrates the value of examination by the Röntgen rays in all instances of the lodgment of a foreign body in the throat or esophagus. The customary use of a probang or coin-catcher for forcing the substance downwards or upwards would have resulted disastrously in this case, as surrounding tissues and the neighboring large vessels would have been seriously injured by the sharp points of the staple, already imbedded in the anterior wall of the esophagus. The view obtained by the X-rays, showing the shape, size, character, and location of the foreign body, rendered its removal possible without resort to the operation of esophagotomy.

A STUDY ON THE VIRULENCE OF THE BACTERIUM COLI IN INFANTILE DIARRHŒA.

(Concluded from page 15.)

BY CHARLES GREENE CUMSTON, B.M.S., M.D.,

Assistant Professor of Surgical Pathology, Tuft's College, Boston; Corresponding Member of the Association of Genito-Urinary Surgeons of France; of the Electro-Therapeutic Society of France, etc.

Results and Conclusions.

As to our methods, we employed the following in all cases; a glass rod sterilized in a flame was introduced into the rectum of the child, and by a to-and-fro movement the feces were made to squirt out, and, as they came from the rectum, were received on a sterilized platinum wire. A tube of bouillon was immediately inoculated, and after shaking it a second tube was inoculated from the first.

In order to isolate the *Bacterium coli*, when it was not pure, we inoculated agar tubes either by lines, or by inundation, or simultaneously by both methods, or we employed agar in Erlenmeyer's flasks. When once the bacillus was isolated, it was inoculated in Loeffler's bouillon, which was used for inoculation of the guinea pigs. Potato cultures were made in every case as a means of controlling the purity of the cultures, and we inoculated milk in nearly all our cases in order to control the coagulating action of Escherich's bacillus. We did not use gelatine on account of the great heat of this summer; but as this culture medium is only important for the study of the morphology of the *Bacterium coli*, we did not consider it as indispensable to our researches.

The guinea pigs inoculated were all young animals, and, as nearly as possible, were of the same weight. All the inoculations were made subcutaneously in the abdomen near the flanks. The hair was shaven and the skin washed with a solution of sublimate.

We employed Meyer's syringe with a platinum needle, which is easily sterilized, and this was carried out carefully for each injection.

The autopsy of the guinea pigs was made as soon as possible after death and a bouillon was inoculated with the blood taken from the heart of the animal with all necessary precautions. In all the guinea pigs that died we obtained from the very first generation pure cultures of the *Bacterium coli*, consequently proving that it was certainly this organism that produced death.

Regarding the autopsy of the child who is the subject of Case 13, we proceeded in the following way: All the organs were cauterized from the outside. A small incision was made with a knife passed through the flame, and through this incision the platinum wire was introduced.

The number of our cases of diarrhœa is, unfortunately, small, on account of the rarity and the relative lightness of the summer diarrhœas of the summer of 1893; and we were not able to examine infectious cases which so often and quickly carried off these little patients in a few hours.

Thus from July 15 to September 15, 1892, the *Hôpital des Enfants Malades*, of Geneva, only registered 14 cases of summer diarrhœa, 8 of which were fatal (a mortality of 57 per cent.); while from the 15th of July to the 15th of September, 1893, only 6 cases were entered and 2 died (a mortality of 33 per cent.). Out of a total of 13 cases, 4 died, thus making a mortality of 31 per cent.

The first question which we should consider is to find out if the *Bacterium coli* predominates over other microbes in the feces of children having summer diarrhœa. The *Bacterium coli* was present in a pure condition in 3 of our cases (Cases 1, 4 and 8), the streptococcus in small quantity was mixed with the former organism in 8 cases (Cases 2, 5, 6, 7, 9, 10, 11 and 12); only once did the latter microbe predominate (Case 3), and yet the patient was well at the end of 11 days. *A fact to be remarked is that if the Bacterium coli does not show an increased mobility at the time when the patient is worse the severity of the disease is due to an increase of the streptococci that are present in the intestinal tract.*

In Case 13 the blood of the intestine after death did not contain *Bacterium coli*, while the feces during life and the foci of broncho-pneumonia gave streptococci as well.

All our cases contained the *Bacterium coli* and the streptococcus which probably played an accessory part and disappeared or greatly diminished from the time convalescence began. The virulence of the infectiousness of all our cases was consequently due to Escherich's bacillus, whose exaltation in virulence caused all the other usual inhabitants of the intestine to disappear during the first few days.

It is consequently a fact that in the infantile summer diarrhœa that we had under our eyes the intestinal flora became very poor; one or two kinds alone remained but increased in their virulence. The other species were obliged to disappear as the more virulent varieties invaded the intestine. These are the ordinary occupants of the intestine which predominate and are usually inoffensive. The *Bacterium coli* should be placed in the first rank; afterwards the streptococcus. In our cases we were unable to establish any relationship between the virulence of the *Bacterium coli* and the age of the child or the manner of alimentation of the latter, as we observed all the degrees of virulence at the different months of the year and with all the various ways of feeding.

The Virulence of the Bacterium Coli.—In two of our cases (Cases 2 and 3) the guinea pigs did not die. In 11 other cases the animals died

or got well according to the virulence of the *Bacterium coli* at the time the inoculation was made (Cases 3 to 13). The first two cases were very benign, and, in fact, one of them (Case 1), who was well at the end of 48 hours, only produced an elevation of temperature of 1.8° in the animal inoculated.

In the other (Case 2), in which the child got well at the end of 9 days, the first two guinea pigs inoculated, one with the bacillus taken from the feces at the time the child entered the hospital, the other with that taken from a stool two days later when the child was quite sick, got well in a little more than a week, during which the animals had a high fever and a considerable loss in weight. Besides, both of them had a large placque of necrosis at the point of inoculation. Now, the guinea pig inoculated at the end of the diarrhœa only presented a slight degree of elevation of the temperature with a little loss in weight and a very small placque of necrosis at the point of inoculation, and was well at the end of 5 days.

Here are two benign cases cured in a very short time and in which the *Bacterium coli* was not sufficiently virulent to kill the guinea pigs, and still in these observations a certain degradation in the pathogenic action may be found which was proportional to the condition of the child at the time the cultures were made, which is translated in the animal inoculated at the end of the diarrhœa by a less elevation in the temperature and a smaller loss of weight, as well as by a diminution in the placque of necrosis, than in the animals inoculated when the diarrhœa was at its height.

In 7 cases of summer diarrhœa varying in duration from 11 days to 2 months (Cases 3, 4, 5, 6, 10, 11, 12) the *Bacterium coli* killed the animals in a lapse of time varying from a few days to a few hours, according to the gravity of the case at the time the inoculation was made. But the animals inoculated at the time when the patient was cured did not die; nevertheless, there was one exception (Case 12); the animal inoculated at the time in which the condition of the child was bad got well in a few days.

Of the 4 cases ending in death, 2 appear to us to demonstrate the fact that the aggravation of the disease and the exaltation of the virulence of the *Bacterium coli* are in direct relation to each other. In fact, in Case 8, Escherich's bacillus, 5 days before the death of the child, killed the animal in 4 days, during which he presented a very high temperature with a loss of weight and a patch of necrosis at the point of inoculation. The autopsy showed us very marked lesions of a general infection. The *Bacterium coli* taken from the feces expelled a few hours before the death of the child, killed the guinea pig which was inoculated with it in less than 24 hours, with a beginning of peritonitis and pulmonary congestion. A second animal inoculated with the blood of the first guinea pig died at the end of 3 days from a generalized infection.

In Case 13 two died from a general infection. The increase in the virulence of the *Bacterium coli* was very marked and distinct. At the

time of entering the hospital the child was not very sick, and Escherich's bacillus at this time only produced an elevation of the temperature and a slight loss of weight in the guinea pig inoculated, and the animal got well after four days. At the time when the condition of the child began to get worse, the *Bacterium coli* produced the death of the animal in eight days by pulmonary congestion, and this organism, taken from the feces expelled by the child a few days before its death, killed the guinea pig in less than twenty-four hours.

In the patient who is the subject of our 9th case, and who died after a week of sickness following a secondary infectious broncho-pneumonia, we were not able to make cultures at the time when the child was very sick; but the *Bacterium coli* isolated from the feces the first time that we saw the child, when he did not appear very sick, killed the guinea pig in three days, during which time the animal had fever and a slight diarrhœa and at the same time lost weight.

Case 7, ending in death after a month's sickness, is an example of the virulence of the *Bacterium coli* in those cases which last a long time and which are so rebellious to all treatment. Now, the guinea pig inoculated died in less than twenty-four hours with a sanguinous edema at the point of inoculation and pulmonary congestion. There consequently was a parallel between the virulence of the *Bacterium coli* and the general condition of the child at the time when the organism was taken from the feces. Consequently, the general condition of the patient is probably due to intoxication by the soluble products of Escherich's bacillus; while no conclusion may be drawn as to the virulence of the *Bacterium coli* as regards the ulterior prognosis of the disease.

Is the more or less considerable mobility of the *Bacterium coli* in constant relation with its virulence? And the *jumping movements* that we have so often seen, do they indicate an exhaltation of the organism? In order to elucidate these questions we have taken note of the mobility of the *Bacterium coli* which was inoculated into each guinea pig and also the time elapsing between the time of the inoculation and the death or the recovery of the animal. During our researches we inoculated 31 guinea pigs and of this number 12 recovered. The *Bacterium coli* only three times presented a *jumping movement* of medium intensity; twice the mobility was quite considerable; while in the seven other cases the mobility was very slightly marked. Those 19 guinea pigs which died may be divided into two groups; first, those which died at the end of from three to five days after inoculation; and secondly, those which died in less than three days. The number of the first is eight, and in them the *Bacterium coli* inoculated possessed a very intense *jumping movement.* Twice the organism was quite mobile; while in the other guinea pigs which died at the end of four, five and eight days the organism was only slightly movable.

Of the 11 guinea pigs which remained, 9 died in less than 48 hours, and in these we remarked that the *jumping movement* was of great intensity, twice; of medium intensity, once; and once Escherich's bacillus was only slightly movable; while in the five others it was very active.

In two animals which died about 48 hours after inoculation the *Bacterium coli* once had a very intense *jumping movement* and once it was very active.

It will be seen from what has been said that, generally speaking, the exalted mobility of the *Bacterium coli* indicates a more considerable virulence; while the jumping movement did not correspond to an exalted virulence in comparison to the cases in which there was a great mobility without the jumping movement.

Before citing our cases, we wish to say a few words regarding the virulence of the *Bacterium coli* taken from organs other than the intestine. In our Case 13, in which death occurred from secondary broncho-pneumonia, to be brief, we saw that the guinea pig inoculated with the organisms taken from the blood of the heart of the child, and which were endowed with a very accentuated jumping movement, died at the end of 35 hours. The animal inoculated with the very active *Bacterium coli* taken from a focus of broncho-pneumonia, died in less than 48 hours. The guinea pig inoculated with Escherich's bacillus taken from the intestine died in less than 24 hours.

Cases.

Case I.—*Clinical Remarks.*—A boy aged one year came to the dispensary for sick children on August 14, 1893. The child looked as if he were pretty well, but the mother stated that he had been sick for two days. He was brought up on the breast and light soups. He had had eighteen liquid movements of a light yellow color in the last twenty-four hours. Ordered calomel, 0.05 gramme.

On August 16th the child was perfectly well. He had only had one yellow stool of good consistency since yesterday. He was discharged cured.

Bacteriological Examination.—On August 14th we inoculated a bouillon with the fecal matter as it came from the rectum, and a second tube of bouillon was inoculated from the first.

August 15.—Examination of the tube of bouillon, first generation, showed that the liquid was cloudy, with a slight, white, flaky deposit at the bottom of the tube.

Examination by the hanging drop showed the bacterium coli pure, especially the oval type, with a few short rods. Some of the organisms were endowed with a jumping movement; the others had a medium mobility.

Examination of the tube of bouillon, diluted first generation, taken from the bouillon tube of the first generation on August 14th. The liquid was cloudy. There was an abundant flaky, whitish deposit at the bottom of the tube. The hanging drop showed *Bacterium coli* pure under the form of large oval organisms and short, thick rods. The mobility was only slightly marked.

A tube of agar was inoculated from the tube of bouillon representing the second diluted generation.

August 17.—Examination of the agar tube, third generation, inoculated from second diluted generation in bouillon on August 15th.

On the lines some round colonies of a white, opaline color and damp surface were seen. These colonies were very close together, well developed in length and also in breadth. By transmitted light they gave the colors green, rose, yellow, etc. The microscopic examination of a colony showed the *Bacterium coli* pure, in the form of large oval and short thick rods. The mobility was quite notable. A potato was inoculated from the second diluted generation in bouillon.

August 19.—Examination of the potato, third generation, inoculated from a second diluted generation in bouillon August 17th.

The potato was of a very light *café-au-lait* color. A colony well developed in length and only slightly so in width, brown in color, dry and regular surface and scalloped borders was noted. Microscopical examination of the colony showed the *Bacterium coli* pure, in the form of large and small ovals without any rods. The mobility was quite pronounced.

A tube of milk was inoculated with a colony from the agar tube, third generation, of August 17th, and was coagulated *en masse* in twenty-four hours.

Experiments with the Virulence.—August 17th a young female guinea pig, weighing 145 grammes, having a rectal temperature of 38.4° was inoculated under the skin in the right and left flanks with two cubic centimetres of bouillon, second diluted generation, at half past 10 o'clock in the morning.

August 18.—The guinea pig appeared quite well. The weight was 122 grammes; consequently a loss of 23 grammes in twenty-four hours. Rectal temperature, 39.8°.

August 19.—The animal was quite well. Weight, 125 grammes: consequently a gain of 3 grammes since the day before. Rectal temperature, 40.2°.

August 20.—The animal was well and weighed 115 grammes; consequently had lost 10 grammes since the day before. Temperature was hardly 39°.

August 22.—The guinea pig was well and weighed 120 grammes. Temperature was 38.5°.

August 23.—The guinea pig was well and had increased 13 grammes in weight since the day before. Temperature, 38.4°, the same as before inoculation. This animal continued to grow fat and, after a few days, was entirely well.

Case II.—*Clinical Remarks.*—A little girl aged 11 months, entered the hospital for sick children on July 20, 1893. She had been brought up on the bottle. No history could be obtained regarding the commencement of the disease. The child was then pale and weakly. She weighed 6 kilos., 300 grammes. Temperature was 39.4°. There was no vomiting. She had a rice water diarrhœa with a fetid odor. Ordered calomel, 0.05.

July 21.—Morning temperature, 38.5°, evening temperature, 38.4°. Green diarrhœa, seven movements in twenty-four hours. Treatment, bouillon, mustard baths, castor oil.

July 22.—Morning temperature, 37.3°, evening temperature, 37.4°. Seven movements in the last twenty-four hours. General condition, better; appetite increasing. The movements were sometimes green, sometimes yellow, and the diarrhœa remained until July 25th. On July 24th, calomel, 0.05 was given and the treatment consisted of bouillon and rice water.

July 26.—The child weighed 6 kilos., 60 grammes; consequently she had lost 240 grammes since she entered the hospital; but improvement continued and she left well on July 29th.

Bacteriological Examination.—*A.* Fecal matter of July 20th. A tube of

bouillon was inoculated with mucous *débris* in a stool as it came from the rectum.

July 21.—A bouillon, first generation, inoculated the day before, was cloudy with a white, flaky deposit at the bottom of the tube. Examination by the hanging drop showed the *Bacterium coli* pure, in the form of small and medium ovals, bacilli and only slightly movable. One or two chains of streptococci were seen.

July 22.—A tube of agar inoculated on July 21st by dilution from bouillon, first generation, showed a few isolated colonies resembling one another. These colonies were round, opaline, with a damp surface, and there was a production of gas in the lower part of the tube. Examination by the hanging drop of one of these colonies showed the *Bacterium coli* pure, in the form of short thick rods, isolated or two by two, having a great mobility, and with jumping movements of medium intensity.

Another tube of agar inoculated directly from the first generation bouillon showed an immense number of small colonies very similar to those of the foregoing tube of agar.

Experiments with the Virulence.—July 21st, a young male guinea pig, weighing 221 grammes, was inoculated under the skin of the right flank with a gramme of bouillon, first generation. Temperature was 41.5° three hours after the inoculation. This animal appeared to remain in pretty good health. On the 22d the temperature was 41°; on the 23d, 40.5°; on the 24th, 39.6°; on the 25th, 39.8°. On this day he weighed 209 grammes (loss of twelve grammes in four days). July 27th the temperature was 38° and the animal weighed 233 grammes; on July 29th he weighed 236 grammes.

July 31.—A placque of necrosis was found occupying nearly the entire surface of the abdomen; but, little by little, this placque was shed off and the skin cicatrized nicely. The hair grew out again very well.

Second Bacteriological Examination.—B. Fecal matter of July 21st. On July 21st, at two o'clock in the afternoon, and before the castor oil had been given to the child, a tube of bouillon was inoculated with the fecal matter as it came from the rectum. A second tube of bouillon was inoculated from the first, as well as a tube of agar from the second generation bouillon.

July 22.—Examination of tube of bouillon, first generation. The liquid was cloudy and there was a white, flaky deposit at the bottom of the tube. Examination by the hanging drop showed the *Bacterium coli* nearly pure, in the form of short thick bacilli endowed with considerable mobility. There were a few chains of streptococci.

Examination of the second generation of bouillon diluted from the first generation tube bouillon on July 21st. The physical and bacteriological characters were identical to the first generation bouillon tube.

Examination of the tube of agar, third generation, inoculated from diluted tube bouillon, second generation, on July 22d. There were small isolated colonies presenting the same characters as already described for agar *A*. Examination by the hanging drop showed the *Bacterium coli* in the form of short rods and only very slightly movable.

July 25.—Examination of a culture on potato, fourth generation, inoculated from agar, third generation, on July 23d. The potato was of a light chocolate color. A large, well-developed colony had grown on the track of the platinum and was gaining in length. This pellicle was *café-au-lait* color, with a dry, pearly surface, and covered with white regular furrows. The borders were scalloped. Microscopic examination showed the *Bacterium coli* pure, in the form of small ovals and small, thick rods.

Experiments with the Virulence.—A young female guinea pig, weighing 130 grammes and with a rectal temperature of 37.2° at the time of inoculation, received in the right flank a gram of bouillon, first generation, on July 22d.

July 23.—The animal appeared to be well. The rectal temperature was 40.3°. On July 24th the animal still continued to be well. It weighed 278 grammes, consequently losing 32 grammes in two days. The temperature was toward 39°.

July 25.—The animal was well. It weighed 296 grammes, thus gaining 18 grammes since the day before. The temperature was 40.1°. On July 26th the animal continued well, but had lost 3 grammes since the day before. The temperature had fallen to 37.4°. The skin of the abdomen presented in three different places small discharging ulcers, having an irregular form and only slightly indurated. July 27th the guinea pig was very active and weighed 300 grammes, thus having gained 7 grammes since the day before. The temperature was 38°. In the middle of the abdomen a long and broad indurated placque was noted. The upper part of the placque was as hard as leather and of a dark brown color. It was distinctly limited from the surrounding skin by a furrow.

July 28.—The animal was well, although it had lost 17 grammes since the day before. Temperature, 37.8°. On July 29th it continued to be well, but had lost 9 grammes in the twenty-four hours. Temperature, 38.7°. On July 31st the animal was well. The placque of necrosis, which then occupied nearly the entire abdomen, was about being eliminated.

Third Bacteriological Examination.—C. Feces of July 25th, at the time when the child was nearly cured.

A tube of bouillon was inoculated on July 25th, after a dose of calomel had been taken on July 24th. July 26th, examination of the first generation tube bouillon. The liquid was found cloudy at the bottom of tube. A white, flaky deposit was seen. The centre of this deposit was yellowish and thick. The hanging drop showed the *Bacterium coli* pure under the form of small and medium ovals and bacilli which were quite movable.

Examination of the tube bouillon, second generation, diluted from tube bouillon, first generation, on July 25th. This tube showed the same physical and bacteriological characters as the first generation in bouillon, excepting that the deposit was perfectly white.

Experiments with the Virulence.—On the 26th a young female guinea pig, weighing 191 grammes, was inoculated with a gramme of bouillon, first generation, in the right flank at 4:30 o'clock in the afternoon. Temperature, at the time of inoculation, 36°.

On July 27th the animal was quite well. It weighed 173 grammes, having lost 18 grammes since the afternoon of the day before. Temperature, 38.6°. July 28th, animal was well and had increased 9 grammes in weight since the day before. Temperature, 37.6°. At the spot of inoculation a hard brownish placque, about the size of a quarter of a dollar was seen. July 29th, the animal continued well and had increased 3 grammes since the day before. Temperature, 38°. The placque of necrosis had not increased in size. July 31st, condition still good. The placque of necrosis was about to be eliminated.

Case III.—*Clinical Remarks.*—A girl aged seven weeks was brought to the dispensary on July 27, 1893, a small thin child brought up on the breast and with artificial food. In the last twenty-four hours she had taken albumen water. She had had ten movements in the last twenty-four hours, which were very green, slightly liquid; attacks of crying; no vomiting. Treatment, hydrochloric acid, six drops in 100 grammes of water.

July 31.—Eleven movements in the last twenty-four hours, but which had diminished since the morning. They were still very green and grumous. The night was better.

August 1.—Five movements, still green, but less abundant. Night good. August 5th, stools better and now yellow, but still grumous. August 6th, two or three movements. Water and milk, half and half, were given and the albumen water was stopped.

The child was seen on August 14th and was well, excepting constipation, which was cured on stopping the feeding by the breast for two or three days.

Bacteriological Examination.—Feces of August 5th, greenish yellow, containing white flakes. August 6th, examination of the first generation bouillon inoculated on the fifth with a flake taken from a movement as it came from the rectum. The bouillon was cloudy with a thick, white, flaky deposit at the bottom of the tube. The hanging drop showed long chains of streptococci in the form of the letter S. Other shorter chains, composed of six or eight individuals and endowed with a moderate mobility were seen.

The *Bacterium coli* was also to be found in the form of ovals and bacilli endowed with quite a considerable mobilty; but this organism was in very small quantity.

Tube bouillon, second generation, diluted from bouillon, first generation, on August 5th. The bouillon was cloudy with an abundant white, flaky deposit at the bottom of the tube. On the surface of the bouillon there was a considerable number of gas bubbles. The hanging drop showed that the *Bacterium coli* predominated in the form of ovals and short bacilli. The latter were endowed with great mobility and a jumping movement of great intensity. The chains that were to be found were short, straight and made up of six or eight individuals. The long chains had almost entirely disappeared.

August 7.—A tube of agar, third generation, inoculated from tube bouillon, second generation, by inundation on August 6th, was covered by innumerable small, white, opaline, round colonies with a damp surface. In the agar, which was liquefied at the bottom of the tube before the inoculation, a milky white deposit was seen. The hanging drop showed the *Bacterium coli* pure, in the form of small ovals and short, thick bacilli.

A second tube of agar inoculated in lines from the preceding tube showed a considerable development of small round colonies closely packed together. The liquid agar which was at the bottom of the tube before inoculation had taken a milky white color. Microscopical examination of a colony showed the *Bacterium coli* pure, in the form of ovals, isolated or two by two, endowed with quite a marked mobility. Both these tubes gave by transmitted light the series of colors.

A tube of bouillon inoculated from the agar, fourth generation, was examined on August 7th, and the liquid was found cloudy with a considerable white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, in the form of large and small ovals and short bacilli, isolated or united two by two, endowed with considerable mobility, with a jumping movement of considerable intensity. This bouillon coagulated the milk in twenty-four hours.

A potato was inoculated on August 9th from bouillon, fifth generation, and was examined August 19th. It gave the following characters: the potato was *café-au-lait* color; the colony was well developed, of a light brown color, its surface dry and its borders scalloped. A microscopical examination showed the *Bacterium coli* pure, in the form of long and short bacilli and small ovals.

Experiments with the Virulence.—A young male guinea pig, weighing 177 grammes, temperature, 38.7°, very active, was inoculated under the skin of the right and left flank with three cubic centimetres of bouillon, fourth generation, on the morning of August 7th. The next day the animal was less active and had lost 14 grammes. Temperature, 40°.

August 11.—He was very weak; had lost 18 grammes; temperature, 39°. This guinea pig died during the night, and the autopsy was done on the morning of August 12th. The body weighed 144 grammes. All the subcutaneous tissues of the abdomen and thorax were softened and edematous, and when the incision was made a considerable quantity of clear sanguinous liquid escaped. All organs appeared normal, excepting a slight congestion in the lungs.

A tube of bouillon was inoculated with blood taken from the heart of the animal, and examined the next day. The liquid was cloudy and there was a slight, flaky, whitish deposit at the bottom of the tube. By the hanging drop the *Bacterium coli* was found pure, endowed with a very considerable mobility with a jumping movement of great intensity.

A tube of agar was inoculated in lines from bouillon, first generation, and when examined, two days later, small, round, opaline colonies were seen along the lines of inoculation. Their surface was damp. There were a few gas bubbles on the agar, and by microscopical examination the *Bacteria* in the form of ovals and small, short bacilli were found. They were not very movable.

A second guinea pig, a female, weighing 377 grammes, temperature, 39°, was inoculated under the skin of the abdomen on August 13th with 2½ cubic centimetres of bouillon, first generation, from the blood of the first guinea pig. In forty-eight hours this animal had lost 48 grammes. The temperature was 42.2°. August 16th it had lost 15 grammes more; temperature, 40.2°. August 17th the animal had increased 21 grammes; temperature, 40.1°. From this day the temperature fell little by little and the animal gained in weight. On August 22d a hard placque, the size of a one-dollar silver piece, was felt. Its borders were attached and underneath was seen a bright red surface covered with pus.

August 26.—Temperature remained for the last three days at 38.5°. The animal then weighed 328 grammes. The placque of necrosis on the abdomen was nearly well, and the guinea pig was let alone, and entirely recovered in a few days.

Case IV.—*Clinical Remarks.*—Small boy of eleven months was brought to the dispensary on August 5, 1893. The child was a little pale, but otherwise did not appear very sick. Mixed diet. Sick for the last two days with frequent green liquid diarrhœa containing flakes. Convulsions, no fever. Treatment, calomel, five centigrams.

August 7.—Child cried less, but still had green movements, six in twenty-four hours. Treatment, hydrochloric acid in a potion.

August 15.—Child was well and had one yellow movement. Treatment, syrup of lactate of calcium. The child was brought back on August 30th, at which time he was again sick because the mother had given him grapes to eat and had not continued the diet suitable for his age. The child had had vomiting, and green and very liquid diarrhœa for the last two days. We washed his stomach out, but unfortunately the patient did not return, so that we could not continue this treatment.

Bacteriological Examination.—Feces of August 6th, dark yellow, containing flakes and long strings of white mucous, alkaline reaction and slight odor. A tube of bouillon was inoculated with a mucous flake as it came from the rectum. A second bouillon was inoculated from the first.

The next day both these tubes showed at the examination the same physical and bacteriological characters. They were cloudy with thick, white, flaky deposits at the bottom of the tube. By the hanging drop the *Bacterium coli* was found pure, only slightly movable, in the form of small ovals, isolated or two by two. Both bouillons coagulated milk.

A tube of agar, third generation, inoculated on bouillon, second generation, showed on the next day numerous small white opaque colonies with a damp surface, and by transmitted light gave the scale of colors.

Microscopic examination of one of these colonies showed the *Bacterium coli* pure, in the form of ovals. There were a few short, thick bacilli. The mobility was considerable.

A potato, fourth generation, inoculated from agar, third generation, was examined a few days later and showed the following characters: the potato was light brown in color. One colony was light brown in the center and grayish on the borders, which were scalloped. The surface was dry. This colony, examined by the microscope, showed *Bacterium coli* pure, very movable, in the form of large and small ovals and short, thick bacilli.

Experiments with the Virulence.—August 8th, a young female guinea pig weighing 170 grammes, temperature, 37.7°, was inoculated in the morning, under the skin of the right and left flanks with two cubic centimetres of bouillon, first generation. August 9th she had lost fifteen grammes; temperature, 38.8°. Two days later the animal had increased four grammes in weight. The temperature oscillated around 36.7°. At the point of inoculation a small transversal placque measuring two centimetres in length by one in breadth was seen. This placque was then brownish and was easily detached, showing the subcutaneous tissue.

The animal died during the night of August 13th, five days after inoculation. Autopsy performed on August 14th in the morning. Weight 136 grammes; consequently a loss of twenty-four grammes in five days. There was little transparent liquid in the peritoneal cavity. The peritoneal vessels were injected. There was no odor at the points of inoculation. The lungs contained numerous foci of congestion.

The stomach presented some subcutaneous hemorrhages under the pylorus. The other organs appeared normal.

A tube of bouillon was inoculated with the blood taken from the heart of this animal, and was found cloudy on the next day with a white, flaky deposit at the bottom of the tube. By the hanging drop the *Bacterium coli* was found pure, not very movable, in the form of ovals and some bacilli. A tube agar, second generation, inoculated in lines from the bouillon, showed some round, opaque colonies with a damp surface, which, examined microscopically, showed the *Bacterium coli* quite movable, in the form of small ovals, isolated or united two by two.

Case V.—*Clinical Remarks.*—Boy aged three months came to the children's dispensary on July 19, 1893. Had been brought up on condensed milk. Had had diarrhœa and vomiting for the last three days. In the last twenty-four hours the child had had six movements, of a yellowish green color, watery, with fetid odor; but contained no grumous matter. The matter vomited was coagulated milk, odorless, and occurred a short time after eating. The child did not cry and slept well. Treatment, hydrochloric acid, 10 drops in 100 grams of water.

July 24.—The vomiting had stopped since the day before. The appetite was good. Three very yellow, bad-smelling stools since yesterday afternoon. July 29th, excellent appetite. Bad-smelling yellow stools continued; but the

child looked well. August 5th, the diarrhœa was cured; two or three movements daily. There was a point of congestion in the right lung, moderate fever.

August 8.—Bloody stools. Ordered hydrochloric acid in potion and the following prescription :

Benzo-napthol 0.80
Bismuth. subnit. 1.50
Syr. sacchar. 100.0

August 9.—Six greenish, grumous movements with only slight odor; no blood ; the child cries. After this date the child stopped coming to the dispensary.

Bacteriological Examination of the feces containing much mucous and blood of August 7th. On August 8th, the first generation in bouillon inoculated the day before with mucus taken from the feces as it came from the rectum. The bouillon was cloudy with a considerable white, powdery deposit at the bottom of the tube. The hanging drop showed *Bacterium coli* slightly movable, in the form of small and large ovals, single or united two by two, and small, short, thick bacilli; besides, a few short chains composed of from four to six individuals were seen.

Examination of tube of bouillon, second diluted generation, inoculated the day before from bouillon, first generation. The bouillon was cloudy with many gas bubbles at its surface and at the bottom of the tube was a white flaky deposit. The hanging drop showed the *Bacterium coli* quite movable, in the form of small and large ovals or united two by two, and small, thick rods. There were also a certain number of long chains of streptococci.

Tube agar, third generation, inoculated in lines from bouillon, second generation, on August 8th, was examined the next day. Some round, white, opaline colonies with a damp surface were seen and gave by transmitted light the scale of colors. A colony examined microscopically showed us the *Bacterium coli* pure, very movable, in the form of bacilli especially, and some ovals more movable than the bacilli.

Tube bouillon, fourth generation, inoculated from agar, third generation, on August 9th, was very cloudy with a white, flaky deposit on the bottom of the tube on the next day. By the hanging drop the *Bacterium coli* was found very movable and endowed with a jumping movement of medium intensity, in the form of ovals and short, thick bacilli, isolated or united two by two. This bacillus coagulated milk in 24 hours.

Potato, fourth generation, inoculated from the preceding tube bouillon showed, on examination, that the potato was light brown in color. A grayish, white colony had developed well on its surface. The surface of the colony was dry, pearly and with scalloped borders. Microscopically examined, it showed *Bacterium coli* very movable, in the form of small and large ovals and short, thick bacilli.

Experiments with the Virulence.—On August 10th a young female guinea pig, weighing 114 grammes, temperature, 39°, was inoculated under the skin of the right and left flanks with two cubic centimetres of bouillon, fourth generation, at eleven o'clock in the morning.

On the next day the animal had lost nineteen grammes and the temperature was 39.2°. The thermometer did not go above this point up to the time of death, three days later. Autopsy : weight, 111 grammes ; consequently a loss of thirty-three grammes in four days. On the abdomen a large placque of necrosis as large as a twenty-five cent piece was seen. It was as hard as leather and dark brown in color. This placque was easily removed, and underneath was a large, red tumefied surface, covered by a dirty white false membrane.

The lungs contained many foci of congestion. The spleen was rather pale but not increased in size. The stomach contained a dark red substance which looked like digested blood, and, when examined closely, a few brown spots of extravasation of blood in the submucous tissue were seen. The heart, liver, kidneys, and intestines presented nothing to note.

A tube of bouillon inoculated with the blood taken from the heart of this guinea pig was found cloudy with a white, flaky deposit on the bottom of the tube the next day. At the surface of the bouillon a very slight, white pellicle was seen. The hanging drop showed an extremely abundant culture of the *Bacterium coli* pure, endowed with a very great mobility, and presenting the jumping movement of feeble intensity. The form was short, thick bacilli and ovals.

Tube agar, second generation, inoculated from the preceding bouillon in lines showed small, round colonies, some of which were confluent. Their surface was damp and in color they were an opaque white. Bacteriological examination showed *Bacterium coli*, in the form of small ovals and some small, thick bacilli not very movable.

Case VI.—*Clinical Remarks.*—A boy aged two months came to the dispensary on August 7, 1893. The child was small and sickly. It was brought up on the bottle with ordinary milk which at first was not diluted, but later was diluted with one-third water and light soup. Diarrhœa for the last four days, eight or nine movements in twenty-four hours. They were green and yellow, not fetid and without grumous material. They had been watery, especially for the last two days. The child frequently vomited coagulated milk after eating. The appetite was moderate, the face pale and slightly cyanosed. Treatment, sterilized milk thirty-three per cent.; potion containing ten drops of hydrochloric acid.

August 9th.—Vomited less, movements less liquid and yellow, some large rales in the lungs. August 12th, six or seven yellow and green liquid stools. Ordered two-thirds water and one-third milk. August 14th, stopped the milk and ordered a milk-food. August 16th, the movements were still very abundant and green. The artificial food was given twice daily, with rice water, and cognac. August 19th, six yellow movements in fourteen hours. Same *régime*. August 24th, four movements in fourteen hours. From this day on the child commenced to get better and when he was seen on August 28th, he was completely well.

Bacteriological Examination.—Feces of August 7th, soft, pasty, yellow, with slight odor.

Tube bouillon, first generation, was examined next day and found cloudy, with a thick, white, flaky deposit at the bottom of the tube. By the hanging drop the *Bacterium coli*, slightly movable, in the form of ovals, isolated or united two by two, were found. There were, besides, a certain number of long chains of streptococci and short, straight chains made up of from four to six individuals.

Tube bouillon, second generation, diluted, inoculated the day before from bouillon, first generation, was found cloudy, with a small, white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* movable, in the form of bacilli, isolated or united two by two, and ovals. There were also some short chains composed of from six to eight individuals.

Tube agar, third generation, inoculated in lines from diluted second generation in bouillon, was covered on the line of platinum with small, white, round, opaline colonies, with damp surface, and giving the scale of colors by transmitted light. The microscope showed *Bacterium coli* slightly movable, in the form of small and large ovals, and a few short, thick bacilli.

A third tube of bouillon, fourth generation, inoculated from agar, third generation, showed the next day a cloudiness of the liquid with a small white, flaky deposit at the bottom of the tube. By the hanging drop the *Bacterium coli*, pure, was found, in the form of large ovals and medium-sized bacilli, isolated or united two by two. This bacillus coagulated the milk in twenty-four hours.

Potato, fifth generation, inoculated from the preceding bouillon, showed the following characters: the potato was light brown; there was a culture split up in two groups, one upper and one lower. The centre of the lower group was pale with the borders scalloped, dry and whitish in color. The center of the upper group was formed by a white pellicle surrounded by an opaline zone. Microscopically in both groups the *Bacterium coli* was found pure, slightly movable, in the form of bacilli and ovals, isolated or united two by two.

Experiments with the Virulence.—On August 10th a young female guinea pig, weighing 161 grammes, with a temperature of 37.6°, was inoculated under the skin of the right and left flanks with 2 cubic centimetres of bouillon, fourth generation, at eleven o'clock in the morning. The next day the temperature was 40.8°. The animal had lost 20 grammes since the day before, and died two days later.

At the autopsy the guinea pig only weighed 119 grammes, having consequently lost 42 grammes in three days. The lungs were riddled with a foci of congestion. The liver was normal. The gall bladder was full of clear transparent bile. The kidneys were pale. The spleen was small and pale. The bladder was distended by a white milky urine; nothing to be noted in the other organs.

A tube of bouillon inoculated with the blood taken from the heart of the animal was the next day cloudy with a small, whitish, flaky deposit at the bottom of the tube, and by the hanging drop the *Bacterium coli*, very movable, with a jumping movement of medium intensity, in the form of medium ovals and bacilli, was seen.

Tube agar, second generation, inoculated from bouillon, first generation, in lines, showed on the next day a considerable development of small, round colonies, white, opaline in color, with a damp surface and which did not give the scale of colors by transmitted light.

Microscopical examination of a colony showed the *Bacterium coli* not very movable in the form of small and large ovals and short, thick bacilli.

On August 18th a second guinea pig, male, weighing 420 grammes with temperature of 39.1°, was inoculated under the skin of the right and left flanks with two cubic centimetres of bouillon, first generation, from blood of guinea pig No. 1. At four o'clock in the afternoon the animal had increased two grammes in weight, temperature 40.3°; but two days later he had lost seven grammes, and on this day the temperature remained normal. He then began to gain in weight, and, with the exception of a very small placque of necrosis, which was eliminated on August 24th, leaving a well cicatrized surface, it may be said that this animal got well four days after being inoculated.

Case VII.—*Clinical Remarks.*—Girl aged four weeks came to the dispensary August 14, 1893. The child was delicate and shrivelled, brought up on the bottle. Diarrhœa for last two days. Profuse movements, yellow and green, very watery, but not grumous as if non-coagulated. Vomiting moderate after eating. Treatment, solution of lactic acid.

August 16.—Vomiting was less, the movements less profuse and frequent, and were of a yellow color. Ordered water, $\frac{2}{3}$, milk, $\frac{1}{3}$. August 26th, three semi-solid greenish yellow movements. Stomach washed out. Ordered cognac and barley. August 23d, two slightly green movements. Same *régime*. August 26th, six or seven movements daily, liquid, green in color. Same *ré-*

gime. The child did not return and we heard that she died towards the middle of September.

Bacteriological Examination.—Feces of August 14th, greenish yellow, no grumous material. Tube bouillon, first generation, was cloudy next day with an abundant white, flaky deposit at the bottom of the tube. By the hanging drop the *Bacterium coli*, slightly movable, in the form of ovals and large and small bacilli, was found; besides, a few short chains made up of from four to six individuals, were present.

Bouillon, second diluted generation, inoculated on August 14th from bouillon, first generation, was also cloudy with a white, flaky deposit at the bottom of the tube. By the hanging drop *Bacterium coli*, slightly movable, in the form of large, medium and small bacilli and ovals were seen. There were still a few short chains, and Erlenmeyer's tube, third generation, inoculated from bouillon, second diluted generation, was covered next day with some large colonies measuring from 1½ millimetres to 2 millimetres in diameter, and many small colonies measuring one-half a millimetre in diameter. A large number of the small colonies were confluent. The physical characters of the large and small colonies were the same, that is to say, round, with a damp surface and an opaline white color. Microscopical examination of a large colony showed that it was composed of the *Bacterium coli* pure, slightly movable, in the form of large, medium and small ovals and a few bacilli; while the small colonies were composed of the *Bacterium coli* pure, but in the form of medium-sized ovals and bacilli, isolated or united two by two and slightly more movable than those of the large colony.

Tube bouillon, fourth generation, inoculated from Erlenmeyer's tube, was cloudy in twenty-four hours, with a white rim adherent to the tube and at the surface of the bouillon, and a flaky, white deposit was at the bottom. The hanging drop showed the *Bacterium coli* pure, not very movable, in the form of small and large rods and ovals.

Potato, fifth generation, inoculated from bouillon, fourth generation, showed after fourteen hours the following characters: the potato was light brown in color and there was a well-developed culture, color *purée de pois*, slightly darker on the borders, which were scalloped. Surface dry and shiny. Microscopically, the *Bacterium coli* was found very movable, in the form of bacilli and ovals. A tube of milk inoculated from bouillon, fourth generation, was coagulated in twenty-four hours.

Experiments with the Virulence.—August 23d, a young male guinea pig weighing 144 grammes, temperature, 37.8°, was inoculated under the skin of the right flank with a cubic centimetre of bouillon, fourth generation; the animal died during the night. Autopsy: weight, 142 grammes. At the point of inoculation there was considerable bloody extravasation. The lungs were riddled with foci of congestion. All the other organs appeared normal.

Tube bouillon inoculated with the blood taken from the heart of this animal was cloudy the following day with a slight white ring adherent to the tube at the surface of the liquid. The hanging drop showed the *Bacterium coli* pure, very movable, with a jumping movement of great intensity, in the form of bacilli and large ovals.

August 25.—A large male guinea pig weighing 753 grammes, temperature, 37.9°, was inoculated under the skin of the abdomen with three cubic centimetres of bouillon, first generation, from blood of guinea pig No. 1, at half-past ten o'clock in the morning.

August 26.—The animal had lost thirty-two grammes since the day before.

Temperature, 39.1°. August 28th, the guinea pig appeared quite well, had lost two grammes since the day before. Temperature, 38.3°. At the point of inoculation an ulceration with sharply-cut borders was found. The surface was a dirty white and exhaled a very fetid odor. August 31st, the animal was very well. The ulceration on the abdomen was, to our great surprise, nearly cicatrized, and from this day the animal fattened and got perfectly well.

Case VIII.—*Clinical Remarks.*—Small male child one month old, entered the hospital on July 28, 1893. Father and mother were tuberculous, as well as a brother. The mother especially was very weak. Her first child was born before term at seven months and died. The second child was well, aged two and one-half years. The third pregnancy ended by a miscarriage at three months. The fourth child, the subject of this observation, was very small, thin and very feeble.

It had been brought up on the bottle. Green, liquid diarrhœa, without grumous material, feces alkaline, papular erythema on the face and buttocks. On the fingers of the left hand deep ulcerations with undermined edges extending down to the bones, were noted. On the right fourth finger there was an ulceration not quite so extensive as on the left. Ordered calomel, 5 centigrammes.

July 30.—Same condition. Specific treatment, sublimate baths, mercurial frictions, iodide of potassium, 50 centigrammes.

August 1.—Child continued badly. The green diarrhœa had taken on a cadaverous odor, and the child died in the night.

We performed the autopsy on August 2d, at three o'clock in the afternoon. Rigor mortis well marked. The lungs were normal, excepting a slight hypostasis at the base. Heart normal. The spleen was rather small and hard. The kidneys were decorticated easily and appeared normal on section. The stomach contained a little coagulated milk, was slightly dilated, otherwise normal. The small intestine was collapsed. At its lower part it was very much injected. Peyer's patches were ulcerated. These ulcerations were round with sharply-cut yellow borders, while the bottom was reddish. The large intestine was riddled with projecting follicles which were increased in size. The mesenteric glands were very large and white, and on section they were quite hard.

Bacteriological Examination.—A. Feces of July 29th. Tube bouillon was inoculated with the feces as it came from the rectum and before the child had undergone any treatment. The next day the bouillon was cloudy with a white, flaky deposit at the bottom of the tube, while on the sides a few small gas-bubbles were noticed. The hanging drop showed the *Bacterium coli* pure, in the form of rods and ovals, isolated or united two by two, not very movable. Tube bouillon, second diluted generation, inoculated July 29th, from bouillon, first generation, showed on the next day the same physical and bacteriological characters as the first bouillon, excepting that there were no gas-bubbles on the surface. A tube of milk was coagulated by this bouillon in twenty-four hours. Tube agar, second generation, inoculated by inundation from bouillon, second diluted generation, on July 30th, showed on the next day an immense quantity of small, round, white, opaline colonies with rather damp edges. At the bottom of the tube there were some large gas-bubbles. By transmitted light these colonies gave the scale of colors. One colony examined microscopically showed the *Bacterium coli* pure, quite movable, in the form of rods and ovals of small and medium size.

Second tube agar inoculated from tube agar No. 1, in lines, on July 30th, presented on the next day some round colonies, white, opaline, with damp surface, well-developed on the lines of inoculation. By transmitted light they gave the scale of colors. Microscopically the *Bacterium coli* pure, of small and

medium size, isolated, or united two by two, more movable than on the preceding agar, were found.

Tube bouillon, fifth generation, inoculated from a colony from tube agar No. 2, on July 31st, was cloudy the next day, with a small flaky, white deposit at the bottom of the tube. By the hanging drop the *Bacterium coli* pure, slightly movable, in the form of small and medium rods and ovals, was found.

Experiments with the Virulence.—August 1st, a young female guinea pig weighing 176 grammes, rectal temperature, 37.3°, was inoculated under the skin of the abdomen with two cubic centimetres of bouillon, fifth generation. The next day the temperature was 40°, and the animal had lost two grammes in weight.

August 3.—The animal appeared quite well, temperature, 39°, had lost 11 grammes in the last twenty-four hours. August 4th, the animal appeared sick and had lost 18 grammes in the last twenty-four hours. Temperature had fallen to 35°. In the middle of the abdomen at the point of inoculation a wound as large as a five-cent piece, dirty white in the middle with dark red borders, was found.

The guinea pig died at noon and we immediately performed the autopsy. The heart was normal. The lungs were in a very advanced state of passive congestion. By pressing the lungs, a frothy, purulent liquid was expelled. The spleen was normal, likewise the kidneys. The bladder was distended by clear urine in which a few white flakes floated. The liver was friable, but of normal size. The gall-bladder was distended by clear bile. The stomach was distended by gas and contained a little clear sticky mucoid liquid. Besides, a few small submucous hemorrhagic points were noted. The small intestine was in a state of hyperemia and filled with a yellow mucous liquid. The large intestine was entirely filled with soft green feces.

Tube bouillon inoculated with blood from the heart of this animal was examined the next day and found cloudy, with a white, flaky deposit at the bottom. By the hanging drop the *Bacterium coli*, pure, slightly movable, in the form of ovals and bacilli, was found.

Second tube bouillon, inoculated with the liquid taken from a focus of pulmonary congestion, presented the same physical and bacteriological characters as the preceding tube bouillon, excepting that the *Bacterium coli* was more movable.

B. Feces of August 1st taken a few hours before the death of the child, having cadaveric odor. A tube of bouillon was inoculated with the feces as it came from the rectum and examined the next day. It was found cloudy, with a slight, white, flaky deposit at the bottom of the tube. By the hanging drop the *Bacterium coli*, quite movable, in the form of long and short bacilli, and, besides, a very long rod, endowed with considerable mobility, was found.

Tube bouillon, second diluted generation, inoculated August 1st from the preceding bouillon, was also cloudy the next day, with many gas-bubbles on the surface. The deposit at the bottom of this tube was so small that we could hardly discern it. The hanging drop showed the *Bacterium coli* very movable, in the form of ovals and bacilli. Besides, a large number of chains of streptococci were seen. These chains were very movable. The long rods that we noticed in the bouillon generation were present, but in very small numbers.

Tube agar, third generation, inoculated in lines from bouillon, second diluted generation, was examined the next day. On the lines of inoculation a dense agglomeration of small, round, white, opaque colonies with a shiny and rather damp surface was found. Microscopically it was seen that these colonies were composed of the *Bacterium coli*, almost pure, in the form of ovals and bacilli, quite movable ; besides, a few chains of streptococci were present.

A tube of bouillon was inoculated from one of these colonies and the fol-

lowing day it was found to be cloudy, with a small, white border at the surface, which adhered to the tube. At the bottom there was a slight, flaky, white deposit. The hanging drop showed the *Bacterium coli* pure, very movable, endowed with a jumping movement of medium intensity. The rod form predominated. The ovals were very large and isolated, or united two by two. This bacillus coagulated milk in twenty-four hours.

Experiments with the Virulence.—August 4th, a young female guinea pig weighing 143 grammes, temperature, 37.2°, was inoculated under the skin of the right and left flanks with two cubic centimetres of bouillon, fourth generation. The next morning the animal was dead. Autopsy : weight, 141 grammes. Opening the abdomen, the subcutaneous cellular tissue was found very edematous at the points of inoculation. The peritoneal cavity contained much liquid in which floated some whitish flakes. The lymphatic vessels of the peritoneum was greatly increased in size, and here and there were found sub-peritoneal hemorrhagic foci. The peritoneum surrounding the liver on its upper and lower aspects was thickened, opaque and white in color. The pleural cavities were normal. The vessels of the peritoneum were very much injected and some hemorrhagic points and injected glands were noted.

The heart was normal. The lungs presented some foci of congestion. The liver appeared normal. The gall-bladder was nearly empty, and what little bile was found in it was cloudy. The spleen, as well as the kidneys, was normal. The stomach presented nothing particular. The small and the large intestines were normal.

Tube bouillon inoculated with the blood of the heart of this animal was cloudy the next day, with a white rim on the surface adherent to the tube. A small, white, flaky deposit was at the bottom. The hanging drop showed the *Bacterium coli* pure, very movable, with jumping movement of great intensity, and in the form of bacilli and ovals.

August 7.—At six o'clock in the afternoon a young female guinea pig weighing 155 grammes, temperature, 37.6°, was inoculated under the skin of the abdomen with 2 cubic centimetres of this bouillon. The next day the animal appeared well, but had lost 6 grammes since the preceding afternoon. Temperature, 38.5°.

August 9.—The animal was very sick and had lost 12 grammes since the day before. Temperature, 38°. The animal died during the night; that is to say, three days after inoculation. At the autopsy the subcutaneous cellular tissue of the entire abdomen was edematous, and, on section, a bloody liquid with a fetid odor escaped. The peritoneal cavity was normal. Some of the mesenteric glands were increased in size. The heart was normal. The lungs presented numerous foci of congestion. The liver was slightly enlarged and friable. Congestion of the kidneys. The spleen appeared normal. The stomach contained a little gas and clear yellowish mucus. The small and large intestines presented nothing particular.

Tube bouillon was inoculated with the blood taken from the heart of this animal. The next day it was cloudy with a white, flaky deposit in the bottom of the tube. There was a small, white circle at the surface of the bouillon which adhered to the tube. The hanging drop showed the *Bacterium coli* pure, not very movable, in the form of bacilli and ovals.

CASE IX.—*Clinical Remarks.*—A little boy, well nourished and strong, aged eleven months. The mother brought the child to the hospital on July 26, 1893, for a green diarrhœa which had lasted for three days. But beside, she said that she had noticed a few spots on the skin. On examination, a few spots, but not

sufficiently characteristic to make a diagnosis of measles, were found. The child was sent home and we treated him there up to the time of his death.

The child had been brought up on the bottle. He had four teeth which were easily cut. Coughed a great deal. Green diarrhœa not very liquid, but with a very strong smell. Treatment, hydrochloric acid ten drops in a potion. Milk diet.

July 27.—The child appeared better. He had slept well, but coughed a great deal. The spots of the skin had disappeared. Green diarrhœa, ten movements in twenty-four hours. Rectal temperature, 38.7°. Treatment, calomel, five centigrammes, bouillon, milk.

July 28.—Night had been good. Child coughed a great deal. Slight diarrhœa. Vomited his food, but not after each feeding. Anorexia. Eight green movements with a very offensive smell. Auscultation showed large moist *râles* disseminated through both lungs. Rectal temperature, 39.5°. Treatment, castor oil 10 grammes, bouillon, hopped milk.

July 29.—Night had been bad. Child coughed a great deal. The moist *râles* still exist. 5 green movements since the day before. Rectal temperature 40°. Treatment, frictions on the thorax, with camphorated oil, poultices on the chest and back. We saw the child at eight o'clock in the evening, at which time he was very restless. Ordered Dover's powder, 5 centigrammes.

July 30.—The night had been good. The *râles* appeared less marked. Eight movements in twenty-four hours. The last ones were less green. Rectal temperature, 40°. Ordered

℞

Bismuth. subnitr. 1.50.
Pepsin. 0.70.
Salol. 0.40.
M. F. pulv. in dos.
æqu. no. XII.
S. Take one powder every four hours.

The camphorated oil and poultices to be continued; in the evening, Dover's powder.

July 31.—Large moist *râles* everywhere in both lungs; fine *râles* at the right apex. Four brownish yellow movements in the last twenty-four hours. The child was sleepy. Rectal temperature, 40°. Treatment, cold water compress over thorax, to be changed every twenty minutes. Cognac and water. At noon the temperature had gone down to 38.6°.

August 1.—Very bad night, child very restless; the extremities were cold. Brown diarrhœa with a very bad odor, but not cadaverous. Rectal temperature, 40.5°. Ordered cold water compresses, cognac and water. Evening temperature, 39.8°.

The child died at half-past seven o'clock in the morning of August 2d. Autopsy could not be obtained.

Bacteriological Examination.—August 26th, a bouillon was inoculated with the feces taken as they came from the rectum, and a second tube was inoculated from the first.

July 27.—Examination of bouillon, first generation. The liquid was cloudy with a white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* in the form of bacilli and ovals of medium size. There were beside a few short chains composed of four or five individuals. These chains were slightly movable.

Examination.—Tube bouillon, second generation, diluted from first generation, was cloudy on the surface; a few small gas-bubbles were noted, and

at the bottom of the tube a slight, flaky, white deposit. The hanging drop showed the *Bacterium coli* in the form of ovals and bacilli of small and medium size. Marked mobility. There were a few chains as in the bouillon, first generation.

July 28.—Examination of tube agar, third generation, inoculated the day previous by inundation from bouillon, second diluted generation. The agar was, so to speak, entirely covered with small colonies, opaline, white, with damp moist surface. These colonies gave by transmitted light the colors, rose, green, yellow, etc. Microscopical examination of a colony showed the *Bacterium coli* of rather small size and quite movable. Only one or two chains of streptococci were found.

Tube agar, fourth generation, inoculated from the preceding agar in lines, on July 27th. Fifteen large round colonies, opaline, white, with damp surface, were found, and by transmitted light gave the series of colors. Microscopical examination showed *Bacterium coli* pure, in the form of short bacilli and small ovals.

July 29.—Tube bouillon, fifth generation, inoculated the day before from tube agar, fourth generation. The bouillon was cloudy and at the bottom of the tube there was a flaky, white deposit. The hanging drop showed the *Bacterium coli* pure, in the form of short, thick bacilli, quite movable.

Experiments with the Virulence.—On July 29th, at three o'clock in the afternoon, we inoculated a young female guinea pig weighing 210 grammes, rectal temperature, 36.5°, with two grammes of bouillon, fifth generation, under the skin of the abdomen in the right and left flanks. July 30th the animal appeared quite well. She had lost 8 grammes since the afternoon before. Temperature, 39.3.° July 31st, same condition. Had lost 31 grammes since the day before. Temperature, 38.7°.

August 1.—Same condition. Had increased 11 grammes in weight. Temperature, 38°. At the point of inoculation in the right flake a small plaque of necrosis was noted. The borders of the skin around this plaque were very much inflamed and sharply-cut; nothing on the left. There was a slight brown diarrhœa without odor.

August 3.—The animal had died during the night. Autopsy: weight, 161 grammes. The lungs were filled with dark brown foci. On excising one of these foci and placing it in water, it was found to float; consequently it was a pulmonary congestion and perhaps the commencement of a broncho-pneumonia. Heart and liver normal. The gall-bladder was distended with clear bile. The kidneys and spleen were normal. The stomach was pale and filled with a transparent sticky liquid without smell. Near the pylorus a small, submucous hemorrhagic spot was found. The small intestine was pale. The large intestine was entirely filled with healthy feces. The peritoneum reflected light.

August 4.—Examination of tube bouillon, first generation, inoculated the day before with liquid taken from a focus of pulmonary congestion. The bouillon was cloudy with a white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, in the form of small ovals, isolated or two by two; mobility quite considerable. This bacillus coagulated milk in twenty-four hours.

Case X.—*Clinical Remarks.*—Small boy, aged eight months, entered the hospital August 11, 1893. The child was very large for his age, and very thin. Had been brought up on the bottle. The eyes were sunken. The child weighed seven kilos. 370 grammes. Extremities cold. Temperature, 38.6°. Vomited continually; abundant green liquid, very fetid diarrhœa. Ordered calomel, five centigrammes, cognac, lime water, laudanum.

August 12.—Vomiting had stopped. Only slight diarrhœa. Child coughed a great deal. Auscultation showed some moist *râles* in both lungs. Temperature, 38.3°.

From the 13th to the 15th of August the child improved and the diarrhœa became better. The temperature remained at 37.8°, but on the 15th the general condition changed. The diarrhœa returned in the form of liquid, light yellow movements, having a very bad odor and containing much grumous matter. We washed out the stomach with boiled water and the child was given nothing but barley water and cognac.

August 16.—Six greenish yellow stools. Temperature, 37.1.° Same *régime.* August 17th, three brown movements. Temperature, 36.3.° August 18th, three brown movements. Temperature normal. August 19th, an improvement was noticed. Three brownish green movements. Weight 7 kilos., showing that the child had lost 370 grammes since he had entered the hospital. Temperature normal. Second irrigation. Same *régime* up to August 26th, on which date we again washed out the stomach. The temperature remained normal and the child had only three movements a day.

August 27.—Without a known cause the diarrhœa again became very abundant and green, and the general condition which had been fairly good, became bad. The temperature remained, however, at 37°. August 28th, same condition. Green diarrhœa. Four movements in twenty-four hours. Temperature, 37.1.° Weight 6 kilos. 800 grammes; consequently, a loss of 200 grammes in nine days. Ordered calomel, 5 centigrammes.

August 29.—Five green movements in twenty-four hours. Rectal temperature, 37.2.° Castor oil. August 30th, green diarrhœa. Ordered solution of lactic acid at two per cent.

After August 31st, the child began to improve. He took 40 grammes of the lactic acid solution until he left the hospital on September 5th. On September 2d the child weighed 7 kilos. 130 grammes; having gained 330 grammes in five days. On September 1st, the movements became yellow and more or less solid and the child left the hospital cured on September 5th.

Bacteriological Examination and Experiments.—A. Feces of August 15th, light yellow, bad odor, taken before irrigation of stomach. Two tubes of bouillon were inoculated, one with the feces as it came from the rectum; the other from the first tube. On the next day both bouillons presented the same physical and bacteriological characters. They were cloudy with large, white, flaky deposits at the bottom of the tubes. The hanging drop showed the *Bacterium coli* pure, not very movable, in the form of large ovals and small, short rods. There were, besides, a certain number of short chains of streptococci made up of five or six individuals.

An Erlenmeyer's tube, third generation, inoculated August 17th, from bouillon, second diluted generation, was examined two days later. At the surface of the agar there was a considerable development of small colonies, being about a millimetre in diameter, and beside, there were smaller colonies varying in diameter from $\frac{1}{2}$ to $\frac{1}{4}$ of a millimetre in diameter. All the colonies were round, white, opaline, and with a moist surface. Microscopically a large colony was demonstrated to be composed of the *Bacterium coli* pure, with pronounced mobility, in the form of large and small ovals and short, thick bacilli. Microscopical examination of a small colony showed the *Bacterium coli* very movable, in the same form as in the large colonies; but here and there in the microscopical field some straight chains were found, made up of from four to six individuals.

Tube bouillon, fourth generation, inoculated from a large colony in Erlen-

meyer's tube, was cloudy after twenty-four hours, with a small, white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, endowed with a considerable mobility and in the form of bacilli and ovals. A tube of milk inoculated with this bouillon was coagulated in two days in the incubator at 37.5°. Potato, fifth generation, inoculated from bouillon, fourth generation, examined fourty-eight hours after, showed the potato was light brown in color, with a well-developed culture on its surface. The culture had a uniform color of light brown, with a dry surface and scalloped borders, and microscopically it was found to be made up of the *Bacterium coli*, very movable, in the form of small and medium sized ovals and short, thick bacilli.

Experiments with the Virulence.—A. August 23d, a young male guinea pig, weighing 133 grammes, temperature, 37.3°, was inoculated under the skin of the right flank with a cubic centimetre of bouillon, fourth generation. The next day the animal had lost 12 grammes and the temperature was 39°. From this day the animal fattened up and four days after inoculation he weighed one gramme more than on the day of inoculation.

The animal had a small dark brown plaque as hard as leather and the size of a ten-cent piece at the point of inoculation. This plaque was not long in falling off, leaving behind a slight, healed cicatrice.

B. Feces of August 27th, green, containing grumous mucus, taken at the time when the child was the sickest. August 27th, tube bouillon, first generation, inoculated the day before with a piece of grumous mucus as it came from the rectum. The bouillon was cloudy with a large, white, flaky deposit at the bottom of the tube. The hanging drop showed large colonies composed of a short bacillus rounded at the extremities and immovable. This bacillus appeared to be, according to its physical and chemical characters (it was decolorized by Gram) the *Bacterium coli.* Between the colonies, long rods united two by two and endowed with a movement of rotation, were noted.

Second tube bouillon, second generation diluted, inoculated the day before from bouillon, first generation, was also cloudy, with a white, flaky deposit in the bottom of the tube. On the surface some large gas-bubbles were noted, and a thin, dirty white pellicle. The hanging drop showed the same large colonies as the bouillon, first generation, and between these colonies, oval forms of the *Bacterium coli*, slightly movable.

Tube Erlenmeyer, third generation, inoculated from bouillon, second generation diluted, was examined forty-eight hours later. The agar was covered by small, round colonies measuring from $1\frac{1}{2}$ to $2\frac{1}{2}$ millimetres in diameter. They were an opaline white. Their surface was moist. By transmitted light they gave the scale of colors. Microscopically they were made up of the *Bacterium coli*, pure, quite movable, in the form of short, thick bacilli and small ovals. A tube of milk inoculated with a colony from the agar coagulated in twenty-four hours. Tube bouillon, fourth generation, inoculated from a colony of tube Erlenmeyer on August 31st, was examined the next day. The bouillon was cloudy, with a small, white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, quite movable, in the form of short, thick bacilli and some large ovals, isolated, or united two by two. This bacillus coagulated milk in twenty-four hours.

Experiments with the Virulence.—September 1st, a young female guinea pig, weighing 100 grammes, temperature, 37.1°, was inoculated under the skin of the right flank with a cubic centimetre of bouillon, fourth generation, at half-past ten o'clock in the morning. The next day the animal appeared quite sick. She had lost 9 grammes since the day before. Temperature, 39.6°.

The next day the animal died. Autopsy : weight, 87 grammes. Many foci of

pulmonary congestion were found and some submucous hemorrhages in the stomach. Other organs appeared normal.

A tube bouillon inoculated with the blood taken from the heart of this animal was cloudy in twenty-four hours, with a white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, very movable, in the form of short, thick bacilli, and small ovals. These bacilli coagulated milk in twenty-four hours.

Feces of August 31st taken after the child had received 40 grammes of a two per-cent. lactic acid solution, or, in other words, 80 centigrammes of lactic acid.

Tube bouillon inoculated August 31st with feces as they came from the rectum, was cloudy at the end of twenty-four hours, with a white, flaky deposit at the bottom of the tube. On the surface of the liquid there was a white collar adhering to the tube. The hanging drop showed the *Bacterium coli* nearly pure, endowed with a considerable mobility, in the form of bacilli and a few ovals. There were, beside, a few straight chains made up of four or five individuals.

Tube bouillon, second diluted generation, inoculated from the preceding tube on August 31st, was also cloudy, with a thick, white, flaky deposit in the bottom of the tube. The hanging drop showed the *Bacterium coli* quite movable, in the form of small ovals, isolated or united two by two. Some short chains composed of four or five individuals were also present. Tube Erlenmeyer, third generation, inoculated from bouillon, second diluted generation, was examined two days later. The agar presented some small colonies measuring from $\frac{1}{2}$ a millimetre to a millimetre and a half in diameter. They were round, of a white, opaline color and moist surface. Microscopically, the *Bacterium coli* was found pure and endowed with a considerable movement, in the form of short, thick bacilli. These colonies coagulated milk in twenty-four hours.

Potato, fourth generation, inoculated from a colony of tube Erlenmeyer, showed the following characters at the end of twenty-four hours: The potato was a light brown color; there was a whitish gray culture with dry surface and slightly scalloped borders. Microscopically, the *Bacterium coli* pure, in the form of short, thick bacilli, endowed with a jumping movement, and small rods isolated, or united two by two, were seen.

The bouillon, fourth generation, inoculated with a colony from tube Erlenmeyer, was cloudy on the next day, with a white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli*, with a jumping movement of medium intensity, in the form of short, thick bacilli and small ovals.

Experiments with the Virulence.—September 6th, a young female guinea pig, weighing 106 grammes, with a temperature of 37.2°, was inoculated under the skin of the right flank with a cubic centimetre of bouillon, fourth generation. From September 7th to 9th the animal diminished to 99 grammes in weight and the temperature remained at about 39.6°; but after September 10th the temperature fell and the animal fattened. On September 13th a small plaque of necrosis the size of a ten-cent piece was found. This plaque was very hard, and by September 19th it had been eliminated, and the little wound had cicatrized.

Case XI.—*Clinical Remarks.*—A little boy aged six weeks, entered the hospital on August 8, 1893. The child was brought up on the bottle. No history regarding his health could be obtained. He had had a green diarrhœa which had been present for the last eight days, having eight movements in twenty-four hours. The child was thin and very yellow. Treatment: calomel, 5 centigrammes, lime water, bouillon; stop all milk.

August 10.—Amelioration was noticed. The movements were yellow and he

had eight in twenty-four hours. August 11th diarrhœa again became green, nine movements in twenty-four hours. August 12th the child weighed 3 kilogrammes, 600 grammes. The movements were diminished in number, were yellow and he had six a day. Treatment, cognac, hydrochloric acid in a potion, laudanum. August 19th the child weighed 3 kilogrammes, 570 grammes; consequently he had lost 30 grammes in a week. Four to six yellow or green movements in twenty-four hours.

August 21.—Three liquid yellow movements since the day before. Irrigation of the stomach and rectum with tepid boiled water. The general condition remained good up to September 26th, at which time we made a second washing of the stomach. Three dark yellow movements in twenty-four hours. The child was given nothing but barley water and cognac. On August 28th, without any known cause, the child became very sick and the green diarrhœa returned. He had lost 530 grammes in the last week. Ordered calomel, 5 centigrammes. The diarrhœa continued green and profuse, six movements in twenty-four hours.

On August 30th a 2 per-cent. solution of lactic acid was ordered, which only produced vomiting. On August 31st and September 1st the movements were greenish yellow with a very pronounced cadaveric smell. From September 2d to the 16th the movements remained yellowish green, but diminished in number, being only three or four in twenty-four hours, and the odor was not so strong.

On September 2d the child weighed 2 kilogrammes, 770 grammes; consequently a loss of 270 grammes in five days. September 9th, weight 2 kilogrammes, 730 grammes; consequently, a loss of 40 grammes in a week. September 16th, 2 kilogrammes, 715 grammes, a loss of 15 grammes in one week.

September 19.—The child was still in the same condition, but he ate well and milk was well digested. We have not noted the temperature, which was taken with great care night and morning, because it had always remained at about 37°. During the month of October the child began to fatten up, and on the 16th of this month he was nearly well.

Bacteriological Examination and Experiments.—A. Feces of August 8th, liquid, grumous, light yellow. Tube bouillon was inoculated with this fecal matter as it came from the rectum, and the next day it was found cloudy with an abundant flaky, white deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, very movable, with jumping movement of great intensity, in the form of bacilli and ovals. There were, beside, a very few chains of streptococci, both short and straight, made up of from four to ten individuals.

Tube bouillon, second diluted generation, inoculated from preceding tube, showed the same physical and bacteriological characters, excepting that the streptococcus was absent. This tube of bouillon coagulated milk in twenty-four hours.

Tube agar, second generation, inoculated August 9th, from tube bouillon, first generation, was examined the following day. There were well-developed, round, white opaque colonies with a damp surface measuring about a millimetre in diameter. By transmitted light the colonies gave the scale of colors only slightly. Microscopically, the *Bacterium coli*, pure, was found, very movable, with jumping movement of great intensity, and in the form of short rods and large ovals, isolated or grouped two by two.

Potato, third generation, inoculated from colony tube agar on August 10th, was examined a few days later, and presented the following characters: The potato was dark brown in color, with a gray, opaline culture with dry surface, which had well developed on the track of the platinum needle. Microscopic-

ally, we found the *Bacterium coli*, pure, quite movable, in the form of rods especially, and small and large ovals, isolated or united two by two.

Experiments with the Virulence.—On August 9th a young female guinea pig, weighing 159 grammes, temperature, 38°, was inoculated under the skin of the right and left flanks with two cubic centimetres of bouillon, second diluted generation. The next day the animal appeared sick and had lost 12 grammes in weight. The temperature was 40.3°.

August 11.—The animal had lost 15 grammes in the last twenty-four hours, temperature remaining at 40°. The animal died under our eyes the next day and the autopsy was immediately performed. Weight, 105 grammes. The subcutaneous tissue of the abdomen was edematous, and when incised, a thin, bloody liquid escaped. The thoracic and abdominal organs presented nothing particular, excepting congestion of both lungs.

A tube bouillon inoculated with the blood of the heart of this animal was cloudy after twenty-four hours, with a slight, white flaky deposit at the bottom of the tube. There were a few gas bubbles at the surface of the bouillon. The hanging drop showed the *Bacterium coli* pure, not very movable, in the form of bacilli and ovals.

Tube agar inoculated in lines from the preceding bouillon, was examined at the end of twenty-four hours. The first line of the platinum showed a well-developed culture, opaque white, with a damp surface and scalloped borders, resembling the cultures of the *Bacterium coli* on potato. On the other two lines, small, round, white, opaline colonies were seen, with a damp, moist surface. Microscopically, the *Bacterium coli*, pure, only slightly movable, in the form of short bacilli and small ovals was found.

A second guinea pig, male, weighing 346 grammes, temperature, 39°, was inoculated on August 17th under the skin of the right and left flanks with 2 cubic centimetres of bouillon, first generation, from blood of guinea pig No. 1. On August 19th the animal appeared pretty well. Temperature, 40.2°. He died in the night. Weight 284 grammes. The lungs were very heavy and riddled with foci of congestion. All the other organs appeared normal.

Tube bouillon was inoculated with blood taken from the heart of guinea pig No. 2. On the next day it was cloudy, with a small, white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, slightly movable, in the form of large ovals and medium sized rods. This bacillus coagulated milk in twenty-four hours.

B. Feces of August 26th, greenish yellow. Tube bouillon inoculated on August 26th with a bit of mucus as it came from the rectum in the movement, was examined on the next day, when it was found cloudy, with a white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* nearly pure, quite movable, in the form of medium sized ovals and short bacilli. A few straight chains of streptococci, made up of five or six individuals, were also seen.

Tube bouillon, second diluted generation, inoculated from the preceding bouillon on August 20th, was examined and found cloudy, with a white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, quite movable, in the form of ovals and short, thick bacilli, isolated or united two by two. These bacilli coagulated milk in twenty-four hours.

Potato, third generation, from bouillon, second diluted generation, was examined twenty-four hours after inoculation, and presented the following characteristics: The potato was of a very light brown color. A culture was well developed on the track of the platinum needle; the surface was dry, the borders slightly scalloped and of a dark brown color. Microscopically, this cul-

ture was composed of *Bacterium coli*, slightly movable, in the form of large ovals and short, thick bacilli.

Tube agar, third generation, inoculated in lines from bouillon, second diluted generation, showed on the next day well-developed colonies on the track of the needle. They were round, with a damp, white surface and were an opaque white in color. Microscopically, the *Bacterium coli*, pure, very movable, in the form of ovals and short rods, was found.

Experiments with the Virulence.—August 20th, a young female guinea pig weighing 126 grammes, temperature, 36.4°, was inoculated under the skin of the right flank with a cubic centimetre of bouillon, second diluted generation, at 11 o'clock in the morning. The next day the animal had lost 14 grammes; temperature was 36°. The animal died during the night, and the autopsy was performed on August 31st. It showed the following facts: weight, 100 grammes; the point of inoculation in the cellular tissue was necrosed and edematous, in extent about the size of a quarter of a dollar. The heart appeared normal. The lungs were riddled with foci of congestion, liver slightly enlarged; kidneys presented congestion in certain spots, spleen normal; the stomach was empty, but its surface was covered with a transparent, yellowish, sticky mucus; intestines were normal.

Tube bouillon inoculated with blood taken from the heart of this animal showed after twenty-four hours a considerable white, flaky deposit at the bottom of the tube and the bouillon was cloudy. Its surface was covered with a thick, whitish pellicle and a few gas bubbles. The hanging-drop examination of the pellicle and the bouillon showed that they were made up of *Bacterium coli*, in the form of short, thick bacilli and ovals. These bacilli coagulated milk in twenty-four hours.

Tube agar inoculated September 3d from the preceding bouillon, showed after twenty-four hours round, white, opaque colonies, with a damp surface and varying in size from a millimetre to a millimetre and a-half. Microscopically, the *Bacterium coli*, pure, endowed with considerable mobility, in the form of short, thick bacilli and small ovals, was seen.

Case XII.—*Clinical Remarks.*—Boy aged four months, entered the hospital for a green diarrhœa on August 8th. The child looked quite robust. No history of his preceding health. Temperature when he entered, 37.3°; weight, 4 kilogrammes, 950 grammes. Treatment, bouillon, lime water, calomel, 5 centigrammes.

August 9.—Five movements in twenty-four hours. Temperature, 37.1°. Same *régime*. August 10th, great improvement in the general condition. Five movements more yellow than green. Temperature, 37°. Same *régime*. August 11th, six yellow liquid movements. Temperature, 37.2°. Same treatment. August 12th, five liquid yellow movements. Temperature, 37.2°. Same treatment.

From August 12th to the 17th the general condition remained the same; but the number of movements in twenty-four hours diminished. They were still more or less yellow and liquid. On august 19th the child weighed 4 kilogrammes, 560 grammes, consequently having lost 390 grammes since he entered. The temerapture oscillated around 37°. August 27th, without a known cause the condition became worse. The diarrhœacame on again, but the temperature remained normal.

August 28.—Weighed 4 kilogrammes, 320 grammes, consequently a loss of 240 grammes in a week. The diarrhœa became green, three movements in twenty-four hours. Temperature normal. Treatment, calomel, 5 centigrammes. August 30th, green diarrhœa, three movoments in twenty-four hours. Temperature, 36.4.° Treatment, 40 grammes of two per-cent. solution of lactic acid in twenty-four

hours. August 31st, four greenish yellow movements in twenty-four hours. Temperature, 36.6°. The lactic acid continued.

September 2.—The child was pretty well. Movements were still greenish yellow; the temperature still remained normal; weight, 4 kilogrammes, 300 grammes, the child having lost 20 grammes in five days. September 9th, weight, 4 kilogrammes, 150 grammes, consequently a loss of 150 grammes in a week.

The child continued the solution of lactic acid at the dose of 40 grammes a day. The general condition was very good. The diarrhœa had greatly diminished and the movements were quite solid and yellow, two in twenty-four hours. The temperature never went above 37.4°, and the patient left the hospital entirely well on September 16th.

Bacteriological Examination.—A. Feces of August 8th, light green, semi-liquid. Tube bouillon inoculated with the feces as they came from the rectum and a second bouillon inoculated from the first.

Both these tubes showed on the next day the same physical and bacteriological characters, they were cloudy, with a quite thick deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* almost pure, endowed with a jumping movement of medium intensity, in the form of small bacilli and various sized ovals. There were also a few chains of streptococci composed of four or five individuals.

Tube agar, second generation, inoculated from bouillon, first generation. On the next day the agar was covered with some white, opaline, round colonies with a damp surface. By transmitted light they gave the scale of colors. Microscopically, the *Bacterium coli*, pure, quite movable, in the form of short, thick bacilli, and various sized ovals, was found.

Tube bouillon, third generation, was inoculated with a colony from the agar and examined twenty-four hours later. It was cloudy, with a white, flaky deposit at the bottom of the tube and a white collar at the surface of the liquid adhering to the surface of the tube. The hanging drop showed the *Bacterium coli*, pure, with a jumping movement of very great intensity, in the form of bacilli and ovals. These bacilli coagulated milk in twenty-four hours.

Potato, third generation, inoculated August 10th, with a colony from tube agar, presented the following characters: the potato was chocolate color. A light brown culture had developed well. Its surface was dry and its borders scalloped. Microscopically, the *Bacterium coli*, quite movable, in the form of small ovals and short, thick bacilli, was found.

Experiments with the Virulence.—A. August 12th, a young female guinea pig weighing 237 grammes, temperature, 39°, was inoculated under the skin of the right and left flanks with $2\frac{1}{2}$ cubic centimetres of bouillon, third generation. The next day the animal had lost 12 grammes, temperature, 37.5°. Had diarrhœa in the night. Considerable subcutaneous edema, especially over the thorax and abdomen.

Autopsy: weight, 219 grammes. The only lesion that we found was a large number of foci of pulmonary congestion.

Tube bouillon inoculated with blood taken from the heart of the animal was cloudy on the next day, with a small, white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, endowed with a jumping movement of great intensity, in the form of bacilli and ovals.

Tube agar inoculated in lines from the preceding bouillon on August 15th showed that the track of the needle was covered with small, round, white, opaline colonies, with a damp surface, measuring about $\frac{1}{2}$ a millimetre in diameter. Microscopically, the *Bacterium coli*, quite movable, in the form of short, thick bacilli and ovals, was found.

Bacteriological Examination.—B. Feces of August 28th, received as they came from the rectum at the time when the child was taken suddenly worse. On the next day tube bouillon, first generation, inoculated with the feces as they came from the rectum, was cloudy with a white, flaky deposit at the bottom of the tube. The hanging drop showed short chains made up of from four to twelve individuals. These chains were quite movable. The *Bacterium coli*, which was found in very small quantity in the form of ovals, was quite movable.

Tube bouillon, second diluted generation, inoculated from tube bouillon, first generation, was also cloudy, with a small, white, flaky deposit at the bottom of the tube. The hanging drop showed the same chains found in the bouillon, first generation, and a very few *Bacteria coli* which were quite movable, in the form of short rods and small ovals.

Tube Erlenmeyer, third generation, inoculated August 29th from bouillon, second diluted generation, was examined on the following day and was found covered with small colonies measuring from ½ to a millimetre and a half in diameter. These colonies were round, white, opaline in color, and with a moist surface. By transmitting light they gave the scale of colors. Microscopically, these colonies were made up of *Bacterium coli*, pure, quite movable, in the form of short, thick bacilli and a few large ovals. One of these colonies coagulated milk in twenty-four hours.

Tube bouillon, fourth generation, inoculated August 30th from a colony tube Erlenmeyer, was examined the next day. The bouillon was cloudy, with a small white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, quite movable, in the form of short, thick bacilli and a few large ovals. These bacilli coagulated milk in twenty-four hours.

Experiments with the Virulence.—September 1st, a young female guinea pig, weighing 187 grammes, temperature, 37.2°, was inoculated under the skin of the right and left flanks with a centimetre cube and a-half of bouillon, fourth generation, at ten o'clock in the morning.

The next day the animal had lost 21 grammes, and the temperature was 40.1°. On the following day she had lost 14 grammes more but the temperature had fallen to 38.9°. From this day the animal increased in weight and the temperature did not exceed 37.8°. On September 9th we found on the abdomen a small plaque of necrosis, very hard and about the size of a five-cent piece. This plaque fell off a few days later and the small wound which was left cicatrized at the end of four days.

Bacteriological Examination.—C. Feces of August 31st, at the time when the child had taken 40 grammes of a two per-cent. solution of lactic acid ; in other words, a total of 80 centigrammes of lactic acid.

Tube bouillon inoculated with the grumous matter as it came from the rectum was cloudy on the next day, with a white flaky deposit at the bottom of the tube and a thin white pellicle covering the surface of the bouillon. The hanging drop showed the *Bacterium coli* pure, endowed with a well-marked jumping movement, in the form of short, thick bacilli, and medium sized ovals.

Tube bouillon, second generation, inoculated August 31st from bouillon, first generation, was found cloudy on the next day with a considerable white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* endowed with a mobility considerably less than in the bouillon, first generation, in the form of short, thick bacilli and small ovals. There were also a few chains of streptococci.

Tube Erlenmeyer, third generation, inoculated September 3d from bouillon,

second diluted generation, was examined on September 5th. On the agar some round, white, opaline colonies with a damp surface were found. One of these colonies examined microscopically showed the *Bacterium coli* pure, endowed with a considerable mobility, and in the form of short, thick bacilli. A colony inoculated in milk coagulated the latter in forty-eight hours.

Tube bouillon, fourth generation, inoculated from tube Erlenmeyer on September 5th, was examined on the next day. The bouillon was cloudy, with a white, flaky deposit at the bottom of the tube. By the hanging drop the *Bacterium coli*, pure, endowed with considerable mobility, in the form of short, thick bacilli, isolated or united two by two and ovals, was found.

Potato, fourth generation, inoculated on September 5th, from a colony tube Erlenmeyer, showed the next day a culture with a dry surface and slightly scalloped borders. The potato itself was of a light brown color. Microscopically, the *Bacterium coli*, pure, endowed with a jumping movement of medium intensity, in the form of bacilli, was found.

Experiments with the Virulence.—On September 6th, a young female guinea pig, weighing 97 grammes, temperature, 37.2°, was inoculated under the skin of the right flank with a cubic centimetre of bouillon, fourth generation, at 11 o'clock in the morning. The next day the animal appeared a little weak. She had lost four grammes since the day before. Temperature, 39.5°.

September 9.—Four days after inoculation she had lost nine grammes, but the temperature was only 38.3°. From this date the mercury never went above 38° and the animal increased in weight. On September 13th, we found a very small plaque of necrosis at the point of inoculation, and the animal was well one or two days after.

Case XIII. *Clinical Remarks.*—Little girl aged 4 months entered the hospital for sick children on August 18th, 1893. The mother was in prison, and the child was brought to the hospital for a slight diarrhœa which had only been present for the last few days. She was otherwise very well when she came in, weighing 5 kilogrammes, 680 grammes. She was brought up on the breast.

On August 19th, three liquid, white movements were passed. Temperature, 37.5°. The stomach was washed out and barley water and brandy ordered. August 20th, temperature 37.2°. Five yellowish white movements. The same treatment. August 21st, temperature, 36.9°. Three brown movements. Same treatment. August 22d, temperature, 36.8°. Three brown movements. From the 22d to the 26th of August the temperature varied between 36.8° and 36.9°. The child had three brown movements every twenty-four hours.

On August 27th, the temperature suddenly went up in the evening to 39.5° and the next morning it was only at 37.5°. The child had had four greenish yellow movements. On August 28th the morning temperature was 40°, while that of the afternoon was 38.4°. She passed four green movements. The lungs were examined, but nothing found. The weight of the child was five kilogrammes, 270 grammes; consequently the patient had lost 410 grammes since she had been in the hospital. Ordered calomel, 0.05.

On August 29th there was an improvement in the general condition, but the green diarrhœa still continued, there being six movements in twenty-four hours. Morning temperature, 37.3°. Evening temperature, 37.7°. August 30th, the general condition was rather bad. The child was somnolent. The morning temperature was 38°; that of the evening, 39.8°. There was a thick green diarrhœa, six movements in the twenty-four hours. The treatment consisted of a two per-cent. solution of lactic acid to be taken at the dose of ten grammes.

The same condition was found on August 31st. There were disseminated moist *râles*, cough and loss of flesh. The morning temperature was 38.2°; even-

ing 38.7°. A greenish yellow diarrhœa, five movements in twenty-four hours. September 1st, the general condition was still bad. Temperature, 38.2° in the morning ; evening, 38.4°. The child weighed 4 kilogrammes, 630 grammes; consequently she had lost 640 grammes in five days. Green diarrhœa, five movements in twenty-four hours. Lactic acid solution to be continued.

The general condition of the child continued to become worse and worse, and she died on September 5th at nine o'clock in the morning. We performed the autopsy three-quarters of an hour after death.

Cadaveric rigor was marked in the lower limbs, only slightly so in the upper limbs. The body was still warm. The lungs, especially the right, were filled with foci of broncho-pneumonia. The spleen was normal in size and color, and appeared normal in every way. Both kidneys were in a slight state of hyperemia, but presented nothing else of note. Liver and stomach normal. The large and small intestines presented a high degree of hyperemia, but neither Peyer's patches nor the follicles were increased in size. The glands of the mesentery were large, hypertrophied and very hyperemic.

Bacteriological Examination.—A. Feces of August 20th. On August 20th a tube of bouillon was inoculated with the feces which were liquid and of a white color. Then a second tube was inoculated from the first. August 21st, examination of the tube bouillon, first generation, inoculated the day before. The bouillon was cloudy and at the bottom of the tube was seen a white, flaky deposit. Examination by the hanging drop showed the *Bacterium coli* nearly pure, in the form of small and medium sized ovals and short, thick bacilli. Very considerable mobility, with a jumping movement of great intensity. Here and there a few long chains of streptococci were to be seen.

Examination of the diluted tube bouillon, second generation, inoculated from tube bouillon first generation, showed that it was cloudy with a flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* in the form of bacilli and ovals, very movable, with a very intense jumping movement. Beside, there were chains of streptococci much more developed than in the bouillon, first generation.

August 23.—Examination of tube Erlenmeyer, third generation, inoculated from bouillon, second diluted generation. The agar was covered with small isolated, or confluent, round colonies, with a damp surface, varying in size from one half to a millimetre in diameter. Their color was an opaline white. Microscopical examination showed the *Bacterium coli* pure, in the form of small, medium sized, and large ovals, and short, thick bacilli, some of which were united two by two. The organisms were endowed with a very considerable mobility.

August 24.—Examination of tube bouillon, fourth generation, inoculated with a colony from tube Erlenmeyer on August 23d. The bouillon was cloudy, with a small white deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* in the form of medium sized and large ovals, and large bacilli. The organisms were very mobile and a jumping movement of medium intensity was present.

August 26.—Examination of potato, fifth generation, inoculated in lines from bouillon, fourth generation, on August 24th. The potato was *café au lait* in color. The colony was well developed, with a dry surface, the borders slightly scalloped and of a light-brown color. Microscopical examination of this colony showed the *Bacterium coli* pure, in the form of long bacilli and a few small ovals, all endowed with a considerable mobility.

August 27.—Tube of milk inoculated on the 26th from the colony on potato, fifth generation, was coagulated.

Experiments with the Virulence.—On August 24th a young male guinea pig, weighing 136 grammes, rectal temperature, 39°, was inoculated under the skin of the abdomen in the right flank with one gramme of bouillon, fourth generation, at three o'clock in the afternoon. On August 25th the animal was quite well, but had lost 11 grammes since the day before. The temperature was almost 40°. On August 26th the animal continued well, but he had lost 27 grammes since the day before. Temperature, 39.2°. On August 28th the animal was well and had increased 28 grammes in forty-eight hours. Temperature, 38.9°. Nothing to be noted at the site of inoculation. From this day on the animal increased in weight and the temperature remained about 37.2°.

B. Feces of August 28th, at the time when the child began to be worse. August 29th examination of tube bouillon, first generation, inoculated on August 26th with a mucous shred from the feces. The bouillon was cloudy, with a white flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* nearly pure, in the form of large and medium-sized ovals, endowed with a great mobility. A few chains of streptococci composed of four or five individuals were also seen.

Examination of tube bouillon, second generation, diluted, inoculated from the preceding tube on August 28th. The liquid was cloudy and at the bottom of the tube there was a small, flaky, white deposit. The hanging drop showed the *Bacterium coli* in the form of large ovals and short thick bacilli. They were endowed with great mobility and a jumping movement of great intensity. Two short chains of streptococci were also seen.

August 30.—Examination tube Erlenmeyer, third generation, inoculated the day before from tube bouillon, second generation, diluted. On one-half of the surface of the tube, small round colonies about half a millimetre in diameter were seen. Their surface was damp and their color an opaque-white. By transmitted light they gave the scale of colors. On the other half of the agar there were some large colonies, more or less isolated, round, opaque-white in color and with a damp surface. By transmitted light they also gave the scale of colors. A large colony was examined microscopically and showed the *Bacterium coli* in the form of large and medium-sized ovals, some of which were united two by two, and short, thick bacilli. All the organisms were quite movable. Examination of a small colony showed the *Bacterium coli* pure, in the form of medium-sized ovals and short, thick bacilli, endowed with very little movement.

August 31.—A tube of milk inoculated the day before with the third generation, tube Erlenmeyer, was not coagulated.

Examination of tube bouillon, fourth generation, inoculated from tube Erlenmeyer (large colony). August 30th the bouillon was cloudy and the hanging drop showed the *Bacterium coli* in the form of long bacilli and medium-sized ovals, many of which were united two by two. The organisms were not very movable.

September 3.—Examination of potato, fifth generation, inoculated from bouillon, fourth generation on September 1st. The potato was a *café-au-lait* color and a large colony had developed. The surface of the latter was dry and opaline; the borders slightly scalloped and a light-brown color. Microscopical examination showed the *Bacterium coli* in the form of short, thick bacilli and medium-sized ovals endowed with considerable mobility.

Experiments with the Virulence.—On September 1st, a young male guinea pig, weighing 133 grammes, temperature, 38.6°, was inoculated under the skin of the right flank with 1 gramme of bouillon, fourth generation. On September 3d the

animal appeared quite well. He had lost 18 grammes in forty-eight hours. Temperature, 37.4°. At the point of inoculation there was a large plaque, the size of a five-cent piece. On September 4th the condition was the same, but the animal had gained 6 grammes since the day before. Temperature, 37.5°.

September 7.—The animal did not appear well and had lost 16 grammes since the day before. The temperature was 38.5°. On the morning of September 8th, the guinea pig was found dead in his cage. He weighed 95 grammes, consequently he had lost 10 grammes since the morning before. The autopsy showed nothing abnormal, excepting some foci of congestion in the lungs.

On September 9th, the first generation tube bouillon inoculated with the blood from the heart of the guinea pig dying on September 8th, was cloudy, with a white flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, in the form of short, thick bacilli, endowed with a considerable mobility.

September 10.—Examination of tube agar, second generation, inoculated the day before from bouillon, first generation. Some round, white, opaque colonies were seen, with a damp surface. A colony examined microscopically showed the *Bacterium coli* pure, in the form of small ovals and short, thick bacilli endowed with a considerable mobility.

C. Feces taken after the child had taken 80 centigrammes of lactic acid in twenty-four hours.

On August 31st we inoculated a tube bouillon with the feces as they came from the rectum, after the child had taken 40 grammes of a two per cent. solution of lactic acid in twenty-four hours; in other words, 80 centigrammes of pure lactic acid.

September 2.—Examination of the bouillon, first generation, inoculated on August 31st, showed that the liquid was cloudy, with a large white flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, in the form of short, thick bacilli and small ovals. The organisms were not very movable; nevertheless, some individuals were endowed with a jumping movement of medium intensity. There were also a few short chains of streptococci.

A second tube bouillon, second generation, diluted, inoculated from the bouillon, first generation, was cloudy, with a small, white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* perfectly pure, in the form of short, thick bacilli and medium-sized ovals, the organisms being endowed with marked mobility.

September 3.—Tube of milk inoculated the day before from bouillon, second generation, diluted, was coagulated.

Potato, third generation, inoculated on the preceding day from bouillon, second diluted generation, was found of a *café-au-lait* color. There was a well-developed colony, very light brown in color, with a dry surface and scalloped borders. Microscopical examination of this colony showed the *Bacterium coli* pure, in the form of long bacilli and a few ovals of medium size. The organisms were endowed with considerable mobility.

Tube agar, third generation, also inoculated the day before from tube bouillon, second generation, diluted, showed a considerable development of small, round, white opaque colonies, with a damp surface and giving the scale of colors by transmitted light. The microscope showed that these colonies were made up by the *Bacterium coli*, pure, in the form of short, thick bacilli and medium-sized ovals, all endowed with a considerable mobility.

Experiments with the Virulence.—On September 3d a young male guinea pig, weighing 110 grammes, temperature, 38.4°, was inoculated under the skin of the

right flank with a cubic centimetre of bouillon, second diluted generation, at half-past nine o'clock in the morning. The animal died during the night, and autopsy was performed early on the morning of September 4th. The animal had lost 10 grammes in weight. The lungs presented a certain number of foci of congestion. The kidneys were slightly enlarged and pale. The viscera showed nothing in particular.

September 6.—A tube bouillon inoculated with the blood taken from the heart of a guinea pig on September 4th was found cloudy, with a small, white flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, in the form of small thick rods and small ovals. This culture was only slightly movable, but a tube of milk inoculated from this bouillon was coagulated in twenty-four hours.

D. Experiments made with the Blood of the Heart, Spleen, Intestinal Fluid, and a Focus of Broncho-pneumonia, taken at the autopsy of the child on September 5th.

September 6.—The bouillon inoculated the day before with the blood taken from the spleen, remained clear, and hanging drop examination was negative.

Bacteriological Examination of the Blood from the Heart of the Child.—September 6th, tube bouillon inoculated the day before was only slightly cloudy and no deposit was present. The hanging drop showed very small oval bacteria united two by two, but in such small quantity that there were only four or five in the field of the microscope. Nevertheless, we examined the tube four or five days later, and found that the bouillon had become very cloudy, with a large white, flaky deposit at the bottom of the tube, and by the hanging drop we found the *Bacterium coli* pure, in the form of short, thick bacilli which were very movable and endowed with a jumping movement of slight intensity, and a few small ovals.

September 11.—A tube agar agar inoculated from preceding bouillon the day before was covered by small round colonies measuring about a millimetre in diameter, of an opaque-white color, and damp surface. Microscopical examination showed the *Bacterium coli* pure, in form of short, thick bacilli endowed with a jumping movement of medium intensity. A tube of milk inoculated with a colony from tube agar was coagulated on the following day.

Experiments with the Virulence.—September 10th, a young female guinea pig, weighing 123 grammes, was inoculated under the skin of the right flank with a cubic centimetre of bouillon, first generation, at 10 o'clock in the morning. The temperature at the time of inoculation was 37.8°. On the next day the temperature was 45.1° and the animal appeared very sick and died at three o'clock in the afternoon while we were in the laboratory. The autopsy showed that the guinea pig had lost 13 grammes since the inoculation. Foci of congestion in the lungs. Liver enlarged. Kidneys pale. The other organs appeared normal. A tube bouillon inoculated with the blood from the heart of this animal was cloudy on the next day and presented a white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, in the form of short, thick bacilli and medium-sized ovals endowed with considerable mobility.

Intestinal Liquid. Bacteriological Examination.—On September 6th, tube bouillon inoculated the day before at the autopsy of the child with the liquid taken from the cecum was found cloudy with a small, white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, in the form of short, thick bacilli and some of medium length; there were also a few small ovals. The organisms presented only a slight mobility. This bouillon coagulated milk in twenty-four hours.

September 7.—Tube agar agar inoculated the day before from bouillon, first generation, showed a number of small round colonies measuring about one-half a millimetre in diameter; surface damp; color, an opaque white. Microscopical examination showed the *Bacterium coli* pure, in the form of short, thick bacilli, and medium-sized ovals. The organisms were endowed with great mobility.

Experiments with the Virulence.—On September 7th, a young female guinea pig weighing 160 grammes, temperature, 37.8°, was inoculated under the skin of the right flank with a cubic centimetre of bouillon, first generation, at 11 o'clock in the morning. The animal died in the night of September 8th. An autopsy only showed numerous foci of pulmonary congestion and a loss in weight of 27 grammes.

September 10.—Tube bouillon inoculated with the blood taken from the heart of this guinea pig on September 9th was cloudy, with a white flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* in the form of medium-sized ovals and short, thick bacilli endowed with a considerable mobility.

Liquid taken from a Focus of Broncho-pneumonia. Bacteriological Examination.—September 6th, examination of tube bouillon, first generation, inoculated the day before, showed that it was cloudy with a small, white flaky deposit at the bottom of the tube. The hanging drop showed a long, straight bacillus, rounded at its extremities, very movable, and endowed with a jumping movement of medium intensity. Probably we were in the presence of the long type of the *Bacterium coli.* There were also *Bacterium coli* in the form of small ovals and short, thick bacilli, as well as a few short chains of streptococci, made up of five or six individuals.

September 7.—Tube agar, second generation inoculated in lines the day before from bouillon, first generation, showed numerous small, round colonies, measuring from one-half to two millimetres in diameter, with moist surface, and opaque and white in color. By transmitted light they gave the scale of colors. Microscopical examination showed the *Bacterium coli* pure, in the form of small ovals and short, thick bacilli endowed with considerable movement.

September 9.—At five o'clock in the afternoon we examined tube bouillon, second generation, diluted, inoculated on September 7th at ten o'clock in the morning from bouillon, first generation. This tube bouillon was very cloudy, with a whitish flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* pure, in the form of short thick bacilli and medium-sized ovals, some of the latter being united two by two. Mobility was very marked. This bouillon coagulated milk in twenty-four hours.

September 10.—Examination of potato, second generation, inoculated in lines from bouillon, first generation on September 9th. The tube was dark *café-au-lait* in color. There was a well-developed colony with a dry surface, borders slightly scalloped and of a light brown. This colony examined microscopically showed the *Bacterium coli* pure, in the form of small ovals especially, many of which are united two by two, and a few short, thick bacilli. The organisms were only slightly movable.

September 11.—Having noticed the change in the tube bouillon, first generation, already described above, we inoculated on September 10th another tube of agar in lines. This morning the lines of inoculation were covered by a large number of small, round colonies, measuring about a quarter of a millimetre in diameter, opaque white in color and with a damp surface. Microscopical examination showed the *Bacterium coli* pure, in the form of short, thick bacilli and medium-sized ovals endowed with a slight mobility.

Experiments with the Virulence.—September 9th a young female guinea pig weighing 108 grammes, temperature, 38.2°, was inoculated at 5 o'clock in the afternoon under the skin of the right flank with a cubic centimetre of bouillon, second diluted generation. On the morning of September 10th, the animal appeared quite well. He had, nevertheless, lost 4 grammes in weight and the temperature was 39°. The guinea pig died in the night and the autopsy performed on the morning of September 11th, showed the lungs filled with foci of congestion; the kidneys pale, while the liver and the spleen presented nothing particular. The other organs were also in good condition. At the point of inoculation no lesion was found to exist. The guinea pig had lost 8 grammes in weight since the inoculation.

September 12.—Tube bouillon, first generation, inoculated the day before with the blood from the heart of the guinea pig, was very cloudy with a white, flaky deposit at the bottom of the tube. The hanging drop showed the *Bacterium coli* very pure, in the form of short, thick bacilli and medium-sized ovals endowed with a considerable mobility.

September 13.—Potato, second generation, inoculated in lines from preceding bouillon was found to be *café-au-lait* in color. A light-brown colony with dry surface and scalloped borders was well developed at the point of the inoculation in lines. Microscopical examination showed the *Bacterium coli* pure, in the form of short, thick bacilli and small ovals endowed with a jumping movement of medium intensity.

A tube of milk inoculated the day before from bouillon, first generation, was coagulated.

From a study of these thirteen cases we, therefore, draw the following conclusions:

1. The Bacterium coli appears to be the pathogenic agent of the greater number of summer infantile diarrhœas.

2. This organism is the more often associated with the Streptococcus pyogenes.

3. The virulence, more considerable than in the intestine of a healthy child, is almost always in direct relation to the condition of the child at the time the culture is taken and does not appear to be proportional to the ulterior gravity of the case.

4. The mobility of the Bacterium coli is in general proportional to its virulence. The jumping movement, nevertheless, does not correspond to an exalted virulence in comparison with the cases in which the mobility was very considerable without presenting these jumping movements.

5. The virulence of the Bacterium coli found in the blood and other organs is identical to that of the Bacterium coli taken from the intestine of the same individual.

A MEDICAL LECTURER OF 1804.[1]

BEING ABSTRACTS OF NOTES TAKEN BY BENJ. ARCHER, STUDENT OF MEDICINE, FROM THE LECTURES OF DR. BENJ. RUSH.

BY EDWARD WILLARD WATSON, M.D.,
Philadelphia.

We sometimes forget how limited, yet how valuable, was the curriculum of medical study, long ago, in the early days of the century. We have vastly enlarged, divided, and complicated a field that was then far more simple and easy to acquire; but, though taught with less effort and learning, with far less strain, the student in those days started out in life with far better chances than he has to-day of reaching eminence, honor, and respect, by patient, conscientious endeavor. In one aspect only have things changed for the better for the medical aspirant, *youth* is no longer the drawback it was, nor is experience, mere routine experience, regarded with the same reverence. Specialized experience, *expertness* is eagerly sought for, but it is more often found to-day in the youth than in the mature, since we are working upon a new plan of recent growth—a plan of crowded hospitals and clinics and dispensaries, specialized to the utmost, where the youngest work the hardest, and the newcomers are the veterans in the field, and the elders are mostly outside and belong to a bygone age.

To one tired of the turmoil of to-day and its rapidly-changing phases of medical practice—its new, newer, newest remedies and methods, and its flood of persistent, yet evanescent, literature—it is pleasant to turn back to the early days of the century, to the year 1804, when Benjamin Archer, student of medicine, sat and noted carefully in his notebook the wonderful words of wisdom that fell from the lips of Dr. Benjamin Rush. The old college, as we, many of us, remember it, was probably the locality where the lectures were delivered, though many changes had been made before our time. The Medical School built some time after 1800 was rebuilt in 1820, but the lectures contained in the two old notebooks before us were delivered either in the college building proper, or in the building south of it, afterwards replaced by the medical structure we all remember. The surroundings were far better fitted then than now for study and quiet thought; the almost unimproved street, with soft roadway; the shade trees, the footpaths of well-trodden earth; the grass-grown edges where the tall weeds grew at their will in the long summers, and lingered, gaunt and faded, into the winter days; the open fields across the road, and the scattered houses as one looked east across the suburban interval, all spake the infant city growing slowly, blighted by years of pestilence, but still ever extending westward. Beyond, to the west, were more fields and fewer dwellings, and, not far off, the country, tilled or grass-covered, and the river flowing softly

[1] Read before the Section of General Medicine of the College of Physicians at its first meeting in February, 1897. Our thanks are due to Mrs. A. R. C. for the loan of the notes.

between green banks, willow-shaded. North of the college, High street crossed Ninth, and, looking to the east from the corner, one saw at last the signs of compact growth and busy life. And the air was pure and still, for the age of crashing and grinding and jingling and smashing, the age of bells and whistles, of cars, even of busses, was yet far away. The few chariots that rolled grandly and solemnly along, once in a while, were still objects of interest, and the "one-horse chairs" rattled past at rare intervals, and more often the horseman cantered by; but nature was still kind, not yet outraged and driven afar by the crash of modern growth and the hideous thing we call "city life." Off toward the south was the Pennsylvania Hospital, standing in the fields, and known to the students as "The Hospital," where cases were treated and discussed for the benefit of classes by Dr. Rush and other well-known men.

Time-stained but legible, showing evidence of care and pains, these notebooks reveal to us Dr. Benjamin Rush, just as his words impressed the listening student. Other pictures of Dr. Rush exist for us all—pictures of Rush, the popular physician, in his daily rounds; of Rush, the trusted adversary of the scourge, yellow fever, speeding from case to case and dealing, with his calomel and jalap, deadly blows against the deadly foe; of Rush, the army surgeon, chafing and fretting out his eager heart at the poverty and hopelessness of army-hospital routine; of Rush, the long-time hospital physician—all these and many more the camera of time has caught and kept for us; but Benjamin Archer's notebooks give us Dr. Rush as Benjamin Archer, the medical student, listened to him and understood or misunderstood him, with the pardonable failure of the student to always understand all the novel and deep things he hears. We are not fitted to be "heirs of all the (medical) ages in a day."

How accurate the notes are that have come to us in their faded covers and time-stained leaves, it is hard to tell. They are at times wonderfully mixed up, and the most foreign topics are often thrown together in strange and hopeless companionship; but we can be sure that no student invented for himself the well-rounded sentences, the quaint humor, the terse phrases, the acute observation, and the wonderful acumen shown everywhere. There were no clinical thermometers, no sphygmographs, no stethoscopes, no complicated diagnostic mechanism then; but the human pulse was studied as *we* have forgotten how to study it, with an almost amusing minuteness. Ten different kinds or grades of pulse were enumerated, whose very names, as we have them, sometimes carelessly caught and imperfectly recorded by the student, are quite strange to us to-day. Dr. Rush taught that "in feeling the pulse we should use all four fingers and concentrate sensation by shutting our eyes and commanding silence in the room." "We should always feel the pulse in both arms." "In the paronychia the pulse will beat 100° in the radial artery of that arm when it will be at the healthy standard in the rest of the system." This is probably a mistake,

but is any one in a position to positively disprove it? "The pulse is quicker in short than in tall persons;" "a natural pulse is a sign of disease in old people."

The ten grades of pulse taught by Dr. Rush are "five above and five below the healthy standard." Dr. Rush evidently confided to his patients the results of his observation, for he says: "These—the grades observed—convey an idea to my patients of the state of their disease—for instance, when it is a little below the healthy standard, I say, 'it is one degree too weak,' and so above."

"The small-tense pulse is like the jarring of wire; it is called the cat-gut pulse, and occurs only in states of fever." Benjamin Archer also learned, among other things, that "absence of pulse may exist for hours and days with subsequent recovery." "I knew a lady in this city whose pulse was absent for thirty-six hours, from eating six raw oysters—she recovered," which shows very accurate observation, both of the number of oysters and of the havoc they wrought, and would lead us to infer that the half-dozen was as popular then as now, and that even as now, one at least, may have masqueraded under the specious guise of freshness.

The notes were evidently taken down continuously, as the lectures on different topics occurred (Dr. Rush held at one time as many as three lectureships) on Chemistry, Institutes of Medicine, and General Practice; so that we find the notes now telling us that "Animal life is composed of motion, thought, and sensation; animal heat is always the same temperature, in either cold or warm weather;" and the lecturer adds a query, "whether this can be owing to a principle in the animal economy to reduce active heat to latent when above a certain degree, and bring latent heat into action below a certain degree." Then immediately we find that "all intermittents after six weeks' continuence have an inflammatory tendency."

"When diarrhœa comes on in consumption the patient always is relieved of his cough and dies without it;" and again: "The lungs have less sensation and less instability than other parts of the system;" and it is here that we meet the singular statement that "young people will live longer in azote or nitrogen gas than old"—a statement which apparently hints at direful experiments, which in our day would demand the instant action of the two cruelty societies, and the antivivisection society as well.

"A physician should never inquire of what sex a child is, as he may know without," for "the male moves the abdomen and the female the breast most in respiration."

Here we take a new excursion apparently into the field of Therapeutics: "Opium and stramonium when made into coffee, give pleasurable sensations. Opium and ardent spirits keep up sensation. Opium cures pain only by producing a greater degree of stimulus than the pain it cures. The gout is sometimes cured by the arrival of a friend"—evidently something is wrong here with one of the two Benjamins, but we are in doubt which.

"The blood is slower in the brain and extremities than in the large arteries; the arteries have an irritability independently of the heart." "I admit of no oscillatory motion in the blood-vessels." "The blood in the brain contains more oxygen than the rest part of the body." Oh, Dr. Benjamin Rush and Dr. Benjamin Archer, that is to be, tell us who is responsible for this, or is it a divided culpability? As for the spelling, we have never blamed Dr. Rush for that, but some of the sentences which fall behind the standard of the age in rhetorical perfection are matters of doubt. The notes probably aim at fact rather than beauty of expression or grammatical excellence.

Dr. Rush tells his listening class "we have not yet found out the cause of muscular motion," and there at least we find him up to date. Benjamin Archer evidently it is that now tells us: "The nervous system are the brain, nerves, muscles and mind," but Dr. Benjamin Rush (he was careful, was Benjamin) says: "The tongue, *it is said*, is capable of 2,000 motions in a minute." This is a dangerous observation—time has done well to conceal it in this old notebook, and unfortunately it comes out just now, when the demagogue is rampant, to lead him on to further attempts. St. Paul more modestly describes it as an "unruly member."

We were almost startled by the following: "Sympathy or, as Darwin calls it, association, is a phenomenon that remains to be explained." But further reading convinces us that the Darwin of these notes is not the author of the Origin of Species and Natural Selection.

"Taste in general is only to be found in the edges of the tongue and on its tip end . . . . those who have lost their tongues are said to taste with their stomachs;" and Dr. Rush also taught that, like the primary colors, there were primary tastes, and conjectured that their number was also seven.

"Vegetable diet promotes the sense of smell;" appended to this is what we fancy to be a note of the student, who could not avoid mute protest as he writes: "Query: do beasts or birds that live on vegetables possess the sense of smelling in a greater degree than those that live on animal food? Where is the Buzzard, the Dog, and the Fox?"

"Light is matter." "There is a fault in the vision of some persons that hinders them from seeing certain colors; this is said to proceed from the vitreous humors being colored and, therefore, refracting the rays of these colors."

"Dilated pupil is the sign of weakness in the system." "Green is the middle of the seven colors, and is on that account the most natural and agreeable to vision."

Once again we see touches of the fine hand of Benjamin the student: "Sounds are musical tones; noise is the unpleasant sounds." Sometimes Dr. Rush's explanation of observed facts seems to tell us something new, to us at least, as, "We sometimes require one sound in order to hear

another; this appears to be owing to the first sound producing tension in the ear and thereby preparing that organ for hearing other sounds."

From the study of the special senses the notes now diverge to intellectual phenomena. "Some have supposed that the mind of man is material, that it is composed of matter, and that it is acted upon by the senses as stimuli, and that it does or does not die with the body; those who support the latter suppose that it possesses a seminal quality which revives the new body." (It is well in passing just to pause and think what perfect English of to-day the lecturer's words are, and how little language has changed in the last 100 years.) "A third opinion is that the mind is an immaterial being possessing an independent principle from that of the body and is entirely a gift of God. I am unable, as I am unprepared, to decide upon these opinions; neither do I care which of them is right, as it is unnecessary for my purpose. An eminent philosopher has said that both soul and body are a seminal quality, and that there is no spirit; while another has asserted that there is no such thing as matter, that all is a vision or a phantom; thus these two men have robbed us, one of the soul and the other of the body." And so the two Benjamins dispose of Hume and Berkley?

"A sense of duty is the chief thing that distinguishes the man above the brute creation." And then comes one of the wonderful interludes: "I have had an African that could not see a square as we do, and heard of a race that were the same way." The extreme difficulty of locating the responsibility for sentences like this is self-evident; but certainly here we discover the first trace of that eminent being, "the African in the woodpile." To the student of that day how simple must the most intricate physiological and metaphysical problems have seemed when he was told that "motions in the brain are produced by stimulus, and these motions produce thought."

Again we come across "Animals have not the sense of touch." Here evidently "someone has blundered." In regard to pleasurable sensations the lecturer goes on to say: "Benevolence affords pleasure to the mind; nitrous oxide affords pleasure to the mind; so does the warm bath; there is a pleasure the Indians call the joy of fear—it is escaping danger they have been afraid of. Lying in a feather bed when we have been kept from it gives a pleasurable sensation. I have known this sensation to produce convulsions in a number of soldiers when they returned home last war." Dr. Rush was very near the "last war," and the Indians, now a curiosity to us, were very real in those days—nearer than the Hampton Institution. The lecturer then goes on to discuss the pleasure of dying, and then we strike a hopeless sentence: "Chronic complaints are most of them cured by pleasurable sensations of the mind; this subject, well attended to, will probably afford a very valuable acquisition to the materia medica. The body may be compared to a violin, the senses its bow and the Creator its player."

And we see the accurate observation combined with the intelligence, ever acute in discovering the reason of things, in this: "Women can endure excess of pain better than men, because their nerves are more weak and irritable than man's, and are sooner excited beyond the painful point" —where the lecturer has practically anticipated the modern physiologist. "Short persons are seldom long-lived." "Fat persons under 40 are short-lived—a crooked spine predisposes to stomach and bowel complaints."

Speaking of nature, he says; "Nature is entirely a physical mechanism which is purely mechanical, as a ship in water, which often does a great deal of harm or does not act at all in the line of disease," with which we cannot help comparing Hahnemann's "Nature never cures." "In violent diseases," Dr. Rush continues, "nature is like a drunken man that reels and staggers on all sides. The belief that nature is to perform a cure has been a source of very great evil; we should, therefore, in all cases treat her as a noisy cat or dog in a room, viz., turn her out of doors." "In epidemics when the disease comes in with nausea we should use emetics and cathartics; when hemorrhage, use the lancet; when inclined to sweat, sudorifics," advocating the same therapeutic principle that in years long before his day made the sweating sickness into a fatal plague. "When they terminate to the throat and make it sore, use mercury as soon as possible to salivation."

"The itch should not be cured in Hypochondriasis." Shade of the founder of Homeopathy accompany the shade of the great Dr. Rush to regions remote and elsewhere, and converse congenially about the "itch!"

"In men I always have an eye to the piles, in women to catamenia, and in children to worms." His three eyes could now have quite a rest, and his wormy eye especially a sweet and refreshing slumber. But worms were evidently the bugbear of antiquity. Habits of eating were such as would now be considered uncleanly; water for drinking was supplied from old shallow wells and ponds, or questionable streams and springs, but the idea of the universal immanence of worms lost by the learned, survives still among the poor and uneducated, as a legacy from the profession of the days of Benjamin Rush and his predecessors, but could anything equal this? "For tonic medicines or in chronic affections we should take the most medicine when we feel the least of the disease, and continue them for a long time—perhaps years after the complainant is apparently well. Many persons die on not observing this." The end of the century can never excel the wisdom of the above.

Again we wander in a maze of doubt when we come across this: "In administering to our patients we should attend to our conversation; let it be such as to inspire hope, and the price of our medicine according to their circumstances." "But a few medicines are sufficient to cure all diseases."

Under stimulants and sedatives we find "when the heat of the body is above 96° and the skin dry, cold may be applied."

"Flannel next to the skin, lying in bed, eating little and often, promote perspiration; there is no sweat when the heat of the body is above 108°." And again, for fear we might forget it, "cough is often excited by worms in the stomach."

"Palsy has been cured in one arm by applying stimuli to the other." "In debilitated states of the stomach we should always wait for appetite to give food." "We should recommend eating 5 or 6 times a day and 2 or 3 at night." "Solid food is more tonic than liquid, and salt meat than fresh." "The asthma has been cured by a diet of boiled carrots—only beef and mutton, with a little bread, has cured dyspepsia."

Here is a very valuable remark: "Milk for the sick should be taken from cows living constantly on the same kind of food." And once in a while we find an outburst like the following: "A man had better die of his disease than prolong his life a few months by that detestable Brunonian medicine, spirits." But malt liquor, cider or wines are recommended as a part of normal diet. Massage was employed by Dr. Rush as a tonic. He says: "Passive exercises, friction with flannels or the bare hand, strokes of the hand will do better." Consumption, he believed, could be cured by swinging, and he instanced a case of his own where it was successful. "Always let the invalid eat in the morning before exercising." "Sulphur has been supposed to cure the itch by uniting with the matter which produces the disease." The history of Perkins' metallic tractors has been written by Dr. Holmes, but were we in doubt Dr. Rush tells us "there is no specific virtue in Dr. Perkins' metallic tractors." Dr. Rush did not believe in expectancy. "We should attack diseases in their forming state. It is of no consequence what disease is forming." And he was not without worldly wisdom; his system or theory, he tells the class, "requires attention to many things, predisposition, force, remission, exacerbation, and seats of disease." "It is calculated to increase your labors and make your visits more frequent." "It is of a revolutionary and practical nature; it is nearly fifteen years since I first taught these principles."

"Cold is probably the greatest enemy of mankind now existing, and that in all parts of the world, particularly in warm climates."

But should the interested reader ask what was really Dr. Rush's system, one would say blood-letting. To his listening class he opens wide the veins of his mind and pours out on this one topic all his life-blood. His experience was great. Do we ask ourselves sometimes, to-day, whether in abandoning venesection we have lost a valuable therapeutic aid? Here is one who can answer; lancet in hand he contended, not with the far-off foreign diseases of alien type, but at home in Philadelphia; does he but remark: "Blood-letting sometimes brings on chilly fits." He can also add: "I have seen this 100 times." Does he say "bleeding is as necessary in old age and in weakly habits and in children as in the strong and middle life," and does anyone, even then, dare to doubt its safety, he can say,

"Dr. Redman and Dr. Chew, both above 80, bled themselves two or three times a year." He himself had five times bled a child in malignant small-pox. Petechiæ do not forbid it; pain and tense pulse always demand it. It never produces a chronic state. If it is said to favor the onset of intermittents, he can explain that it is because it has driven off and kept at bay the more serious continued fever. The lecturer's words are even poetical as he says: "No other remedies are so safe and sure. The blood-vessels are sometimes insulated, as it were, and proudly refuse to submit to any other evacuation, but that directly from themselves." "But I never saw or heard of a person dying from a fainty fit brought on by blood-letting;" we trust he did not really say "fainty fit." "Blood-letting is less weakening than any other medicines used to such a degree." "But over 50 or 60, more blood should be taken than in middle life." "Inflammation of the rectum and bladder requires more bleeding than even congestion of the brain to remove it." "We had better not bleed at all than not take enough." He bled in consumption, and attributed the cure to small and frequent bleedings." "There are some," he says, "who have as it were the Lancetophobia, these I do not bleed."

Cold in the form of ice cold water or air ranks next in his opinion to venesection. "When there is a moist skin it should never be used at all." This a concise and valuable point. "When there is great morbid action, with a dry skin," cold sponging or cold immersion was recommended. He had himself experienced its good effects, when he had yellow fever. A sparing diet he describes as "roasted apple, rice, tea, coffee, oatmeal, gruel, barley water, and rice gruel." Silence and darkness are great adjuvants to him. Diluents and lemonade entered into his materia medica. Hot olive oil enemata he recommended as stimuli. His views of some drugs may be of interest: nitre reduced the pulse without nausea. Foxglove reduces it. "I have never prescribed a single dose of Spiritus Mindereri." Tartar emetic with ipecac or nitre he preferred. Seneca serpentaria is used in pleurisy and anginose states. Sugar of lead diminishes the pulse and also the irritability of the muscular fibres. "Digitalis acts in a similar way, but we do not require much of it in this country. I think blood-letting preferable. Sweet oil applied externally in fever of great morbid action I think may be useful." Typhus and typhoid states of jail fever can, he believes, be "strangled in its birth" by an emetic; "this I often did in the Revolutionary War." Against spirits, even in low fevers, he had evidently a great aversion. They are "inferior to wine and porter, as they afford no nourishment." While he cheerfully recommends volatile alkali 5 to 10 grains every two hours in pills or boluses, "in spasmodic nervous states opium is a host, an army in itself." "I have given it in doses of from 1 to 4 grains in the low typhus states of fever with very great advantage." Again: "In the low typhus state the patient should not be allowed to sleep more than an hour or two at a time, or he may sleep his last."

"Mercury is a very powerful stimulant and our chief reliance should be upon it in malignant fever, where bleeding is forbidden." "Pure but not cold air is of the utmost consequence in low fevers." All these observations from a time whose traditions are almost lost to us are of interest, and with proper interpretation may be still of great use. However, he goes further: "A great deal may be done by imparting vigor to the understanding and passions and emotions; this has turned the scale in favor of life. Terror has produced good effects in soldiers. Earthquakes have cured many; the pronouncing great names is sometimes useful. Love has recalled the parting strength in low fevers; these are useful only about the crisis. Hope is the cordial which we have most under our command."

Dr. Rush reveals in his lectures the amplitude or the meagreness of the diet lists of the day; in one place he says: "Oysters are proper, but there are some cases where beefsteaks and ham will be necessary." To produce *sudden* effect "boiling water or live coals should be applied to fleshy parts near the head or heart." The whole section devoted to Typhus and Typhoid fevers is well worthy careful study. For its date it is written with great ability and displays original thinking throughout. "Typhus fever," he says, "is the offspring of nature and runs its course in 20 to 30 days" . . . . "the pulse should be the compass from which we should never turn our eyes." "The fever from human miasmata is little known now, though it was prevalent during the Revolutionary war." "At that time I met with as much opposition to my treatment of it as I have since done to my treatment of the yellow fever in this city."

Under "Hetic Fever," he says: "It differs from intermittent as the fits are seldom alike for more than three or four days in intermittents, and they change the time of accession after the third day." Infusion of malt Dr. Rush makes by a receipt of his own—three or four spoonfuls of ground and sifted malt to a quart of boiling water, with a little sugar or wine." This he uses in phthisis and continues for six months. "Arsenic and bark aggravate the disease."

In intermittents and remittents, however, we find him using bark with a free hand in one to two-ounce doses. "If bark loses its efficiency from long use lay it to a side for a few days, and use bitters." "Blisters to the wrists I have found of very great consequence in obstinate intermittents, and when all these fail, change of climate."

In disguised forms of intermittents he gives us all the symptoms which we to-day are rather disposed to regard as belonging to our time, from the reduction of the original poison by drainage and general hygiene, viz: headache, toothache, backache, pain in eyes, convulsions, mania, puking of bile, dysentery, coma, apoplexy, eruptions, gleet, hen-blindness or inability to see after night, dropsy, fever of part of the body only." He believes intermittent to be contagious, so far as the sweat of the body is concerned. Of tertian he says: "It is the original form of yellow fever that puts on this type."

Of signs of death he remarks that they vary at different seasons; falling of jaw, sudden cessation of pain, lying on the back, black vomit; sudden absence of pain, he remarks, is not dangerous with a tense pulse, for if death impends, the pulse will be soft. "Cold wrists with warm hands always produce death. Great thirst, intermittent pulse, a natural tongue in malignant fever, is fatal. A false vision, matter in the inner canthus, pain from slight noise, a revival of hearing in the deaf, looking around, gaping, cold breath, are serious; while asking for a chew of tobacco or a pinch of snuff, is favorable. Convulsions at the close of disease are fatal. Delirium is bad, but a good-tempered delirium not so bad. Enquiry after the day or hour is unfavorable, as is also a desire to remove or go home." "In 1802 there were six grades of bilious fever in the city at the same time, the febricula frequently rising to yellow fever, and yellow fever changing to febricula."

In summing up to his class the subject of fevers we find the lecturer numerating ten in all. He includes diarrhœa, dysentery, cholera morbus, bilious colic, and intestinal fever, and adds: "They are all one disease, and are to be avoided by avoiding exhalations," and goes on to give the rules for preventing putridity in the surroundings of daily life. His advice would be as good to-day as ever: "Wash the streets and houses," "plant trees;" he would also change the very methods of constructing cities. "The colder our winter the more it robs us of sensibility and the more it predisposes to disease the succeeding season." These are strange words from one who lived when yellow fever had become almost endemic, and was attributed to a succession of mild winters. Dr. Rush emphasizes to his class the distinction between *filth* and *dirt*, and when asked "why yellow fever is getting lighter every year," answers: "because our inflammatory atmosphere is subsiding. Likewise, if it is of domestic origin, why does it not occur every year; and answers by asking why does not dysentery occur every year?"

Asiatic plague, he remarks, "is derived from the same source as yellow fever; it has all the forms of yellow fever, with the addition of sweating, and yellow fever nearly all the forms of plague. The difference between the two plagues of Asia and America are owing to the fact that the former produces a more concentrated disease." For once we find a disease in which Dr. Rush does not advocate venesection. "The most effectual remedy of late has been to rub the body all over with sweet oil."

One cannot help gathering from these lectures that Philadelphia early in 1800 was almost a plague-stricken city, especially in the late summer and autumn. The very language of the lecturer is that of one who is surrounded by a mass of miasmatic and filth disease: jail fever, typhoid, dysentery, bilious and intermittent fevers were enough without the addition of yellow fever, which the annals of the time tell us was pretty constantly in evidence for ten continuous years; perhaps from this cause,

driven by dire necessary, the city acquired: first, habits of ostentation, cleanliness, scrubbing of steps and walks, and next, that general reputation, spread by the school books everywhere, which lasted long after the virtue they praised had subsided into the mire of its ill-paved streets and fetid gutters.

So ends the notebook of Benjamin Archer. Abruptly as he begins, so the lecturer ceases; his voice, coming to us from the written page, soundless but far-reaching, fades to silence. The students pour out from the lecture-hall, and we with them—we rub our eyes, as the bright light dazzles us; or do we but pass from one twilight to another, nearer the dawn, and waits there still for us the blinding glare of the real day yet to come?

REVIEW OF MEDICINE.

MEDICINE.

The Widal-Grünbaum Serum-Test for the Diagnosis of Typhoid Fever.

While Pfeiffer was aware of the fact that certain bacteria acted peculiarly when brought in contact with the blood of immunized animals, the practical application of the serum-test for the diagnosis of typhoid fever seems to have been discovered independently by Widal (Séro-diagnostic de la fièvre typhoïde, *Journal de Médicine*, p. 533, 1896,) and Grünbaum (*The Lancet*, September 19, 1896 and December 18, 1896).

The method of making the test is as follows: One to two cubic centimetres of blood is drawn from the finger-tip or the lobe of the ear under aseptic precautions and transferred to the upper portion of a sterilized test-tube. After coagulation about 10 to 15 drops of clear serum will collect in the bottom of the tube. A bouillon culture of the *Bacillus typhosi*, freshly prepared, of known purity, and not containing too many bacilli, is mixed with a drop of the serum and examined in the course of one-half of an hour under the microscope in the form of a hanging drop. If the reaction does not take place, the bacilli will be seen in active movement across the field; while if the reaction succeeds, the bacilli are shortly agglutinated in clumps, with only a slight movement of those bacilli found around the periphery. This reaction is best studied by the use of a low power, followed by the oil immersion. The bacilli soon assume a granular appearance showing that degeneration sets in rapidly.

A positive reaction is usually obtained after the 5th to 8th day of the disease and lasts for a long while after convalescence has been fully estab-

lished. A number of the Boards of Health in our large cities have already made arrangements to make this test for physicians, and at the time of writing it would seem as if the bacteriologists had supplied us with a test of great utility. The difficulty of isolating the typhoid bacillus from the colon, the diazo-reaction as found in other cases than typhoid fever, and the unrealized expectations from Ehrlich's typhoid toxin in urine should caution us in making a too hasty conclusion in regard to its pathognomonic value. A rich field of observation is opened for experimentation with other, especially motile, bacteria, such as those of cholera (Gruber and Durham), diphtheria (Nicolas), Diarrhœa as *Bacillus coli* (Rodet) and Proteus vulgaris, relapsing fever (Gabritschewsky), etc.

Besides the abstracts given below interesting and valuable papers have appeared from Gruber: *Wiener klinische Wochenschrift*, Nos. 11 and 12, 1896. Gruber and Durham: *Münchener medicinische Wochenschrift*, March 31, 1896. Durham: *Proceedings of the Royal Society*, January, 1896, and *Journal of Pathology*, July, 1896. Rodet: *Lyon Médical*, September 20, 1896. Other papers by Widal, Achard, and others in recent numbers of the *Semaine Médicale*. Johnston, of Montreal, Fränkel, of Halle: *Deutsche med. Wochenschr.* Breuer, of Königsberg, *Berliner klin. Wochensch.* Nos. 47 and 48, 1896, who examined 43 cases of typhoid fever and found the reaction to be present in every instance, while 27 patients suffering from other diseases did not react), and many others. CATTELL.

I. Notes on the Diagnostic Value of the Serum of Typhoid Fever Patients. (*Lancet*, December 19, 1896.) By Herbert E. Durham, M.B., of Guy's Hospital, London.

II. The Diagnosis of Typhoid Fever and Widal's Serum Method. (*Deutsche. med. Woch.*, January 8, 1897.) By Dr. Haedke.

III. Serum Diagnosis in Typhoid Fever. (*Centralblatt für innere Medicin*, January 23, 1897.) By Dr. R. Jemma, of Genoa.

IV. The Widal Method of Serum Diagnosis of Typhoid Fever with Reference to the Dry Method. (*Wien. klin. Woch.*, January 28, 1897.) By Friedel Pick, of Prague.

I. The observations of Durham, commenced early last summer, were made in order to determine whether a positive reaction could be obtained by the Widal-Grünbaum method in all cases of typhoid fever, it being clear that if such evidence cannot be thus secured, the diagnosis cannot be made absolutely definite in doubtful cases. Dr. Grünbaum has shown that in conditions other than typhoid fever, the blood serum has no decided effect upon the typhoid bacillus when it is sufficiently diluted. This is in accord with the author's own experiments upon animals im-

munized against various kinds of microbes, whence it seems that in high dilutions (1 to 5 %), positive reaction is only obtained with the same kinds of microbes as those used in immunizing the animal from which the serum was obtained. Close observations upon typhoid fever in man show that these positive results are not invariably obtainable; consequently some cases remain in doubt, even with this means of diagnosis. The serums of immunized animals have little or no clumping action shortly after the first inoculation, and the typhoid patient or convalescent is really only immunized to a very slight degree—sufficient, however, as a general rule to protect him from further attacks. In recent cases of typhoid fever an absolute diagnosis cannot always be secured by the serum test; but this means of diagnosis should not therefore be discarded, nor should it be allowed discredit by overestimating its real value.

CATTELL.

II. A large number of experiments were undertaken by Haedke, using Elsner's method, to determine the presence of the typhoid bacilli in the evacuations of typhoid fever patients. In a small number of these the results were excellent. In a number of cases that were clinically certain the method failed entirely; and in the rest, although there was some differentiation between the colonies of typhoid bacilli and of the *Bacterium coli communis*, nevertheless it was too slight to admit of separation; he therefore concluded that the method of Elsner, although of some value, was by no means certain. A series of experiments were then undertaken to determine the value of Widal's reaction. Twenty-two cases of certain typhoid were examined, and twenty cases of other diseases. The first group of experiments was made by adding the serum to pure bouillon cultures of typhoid bacilli. In all the cases of typhoid fever there occurred, after varying periods, an evident granulation of a previously homogeneously cloudy liquid, and this granular appearance could not be dissipated by shaking. The time at which this reaction occurred was variable; usually six to eight hours was sufficient, and in one case it occurred in one hour. After standing some time the bouillon did not again become cloudy, but living typhoid bacilli, which could be cultivated, were found in the sediment at the bottom. It was found to be important that the proper proportion between the bouillon and serum should be maintained, one part of serum to ten of the bouillon culture proving the most satisfactory, although occasionally a positive result was obtained when the proportion was one part to fifty. Of the twenty control cases, eighteen were patients suffering from pyrexia. In all of them the result was absolutely negative. In one case a certain amount of granulation occurred which was easily dissipated by shaking. The microscopical experiments in the hanging drop were even more satisfactory than those with the bouillon. Sometimes the reaction

seemed to occur instantaneously, although occasionally it did not appear until after a quarter of an hour. The control experiments, as before, were negative, excepting that occasionally, there seemed to be a slight tendency to agglutination; particularly was this true in one patient suffering with gangrene of the lungs. The authors conclude therefore, that when the Widal reaction occurs promptly in the hanging drop, typhoid fever can be diagnosed with great probability; and that some other disease must be suspected if the reaction does not occur during the period from the first to the sixth week. One case examined four weeks after convalescence gave a negative result. In conclusion the author reports some interesting cases. In one the disease commenced suddenly in a patient subject to attacks of colic, there was vomiting, icterus, and some distension of the abdomen; the serum diagnosis was positive; no other typhoid signs were present and the patient rapidly developed hallucinatory psychosis. At the autopsy the lesions of typhoid fever were found. In another patient, the febrile period lasted less than a week; the serum diagnosis was positive and a typical typhoid relapse occurred. In two other cases the symptoms upon admission would not have led to the suspicion of typhoid fever had not Widal's reaction been positive in both cases, and the subsequent clinical course of the disease confirmed the serum. [Chantemesse has also reported a case of typhoid fever, in which the symptoms were purely psychical. The diagnosis was made by Elsner's method and confirmed by autopsy. It is possible that this form is of not infrequent occurrence.] SAILER.

III. In a series of observations upon the blood serum of typhoid fever patients by Widal's method, made by Jemma with reference to the body temperature, the writer finds that the reaction is much more prompt and characteristic during the periods of highest fever. Jemma himself, and later Widal and Picard, have demonstrated that the period of greatest bactericidal power of the serum coincided with that of greatest efficiency in producing the Widal reaction, but Jemma claims that this is the first time that it has been shown that both correspond with the acme of the fever. During hyperpyrexia the amount of serum needed to obtain the Widal reaction is greatly reduced. In a patient with an axillary temperature of 40.5° C. (104.9° F.), two drops to four cubic centimetres of bouillon culture gave a distinct reaction, while usually the serum must be in the proportion of 1 : 10. Globulin, isolated from the serum of typhoid cases, when dried at the room temperature, gives the reaction with great rapidity. Since the globulin of such cases presents no recognizable chemical changes from that of healthy serum, it is probable that it associates with it the agglutinating principle. Jemma reports 12 cases, 9 in the stage of infection and 3 in convalescence, in all of which the reaction was positive. In 6 the bacilli were found in the feces and milk. In 15 cases of other diseases the reaction was invariably absent. The effects of heat upon the agglutinating

action of the serum are as follows: 37° C. for 96 hours has no effect, nor does one of 40° for 50 hours. But 55° for 40 minutes or 60° for 20 minutes almost, and 70° for 10 minutes entirely destroys its power to produce the reaction. At ordinary temperature the serum remains potent for 40 days.

STEELE.

IV. Pick undertook extensive investigations in regard to the value of this reaction, using the usual methods. A very large number of persons, either in good health or suffering from some other disease than typhoid fever were examined, and, unless the proportion of serum to culture was very excessive, when there would be a slight tendency to agglutinization, but not the characteristic reaction, the results were invariably negative. In 20 cases suffering from typhoid fever, the diagnosis being made from the clinical course, the reaction was positive; in some, however, it was only found after repeated examination. In 4 of them it required from 10 to 30 minutes for the reaction to appear. In the only one where it was possible to say with certainty when the disease had commenced, the result was not very evident on the third day, but became characteristic later. Two cases are reported in full, in which the method was of great clinical value. In the first, a girl of 19, who had had typical prodromal symptoms for a week, was brought to the hospital with a temperature of 39½°C. The serum test was negative, but the appearance was so characteristic that baths were commenced. Local paralysis and herpes labialis showed that the case was really one of meningitis, a diagnosis that was confirmed at the autopsy. In the second case a young woman of 23 was brought into the hospital with a history of having been sick for 16 days. There was remittent fever ascending to 39°. There was no enlargement of the spleen nor any evident roseola. The serum test was promptly positive. Five days later Cheyne-Stokes respirations commenced, followed three days later by death in collapse. At the autopsy the characteristic lesions of typhoid fever were not found; however, bacteriological examination of the case showed that the infection was due to the presence of the typhoid bacillus. A culture from the spleen, however, was negative, and an extract of the splenic pulp failed to give the Widal reaction, although extract of the mesenteric glands gave it characteristically. In order to devise some practical method for clinicians, Pick allowed drops of blood drawn from the finger to dry upon glazed paper. These were mixed with a little sterile bouillon and then inoculated from a fresh culture of typhoid bacillus and examined in the hanging drop. The method was quite as good as the others in which the hanging drop was used; it has, however, two disadvantages. In the first place the liquid is rather deeply colored with hemoglobin; this, however, does not interfere with the recognition of the bacillus when agglutinated. Secondly, it does not permit of the exact determination of the relation of

the serum to the bouillon. Control experiments with normal blood failed invariably to give any trace of the reaction, although occasionally immediately after the preparation has been made there was a slight tendency on the part of the bacillus to move slightly or not to move at all. Practically the method can be used by physicians at a distance from a well equipped laboratory, by simply sending slips of paper upon which the blood has been dried, through the post to a bacteriologist. In conclusion Pick questions if the blood of every typhoid patient gives reaction, and if this reaction is peculiar to typhoid blood and occurs in no other condition? The first question he answers in the affirmative; in regard to the second he admits that when normal serum is mixed with bouillon culture in proportions of 1 to 1 or 1 to 2, there is occasionally agglutination, but as far as he knows never when the proportion is as low as 1 to 10.

SAILER.

Appendicitis as an Epidemic Infectious Disease. (*Berliner klinische Wochenschrift*, January 4, 1897.) By Prof. Goluboff, of Moscow.

The writer holds that appendicitis is an infectious disease with a separate identity and is peculiar to the appendix in the same degree as follicular angina is to the tonsils, or dysentery to the large intestine. The affection occasionally assumes an epidemic form. In support of this view is the fact that in Moscow, during the spring, summer, and autumn of the past year, the number of cases of appendicitis have increased to four or five times the average of the past ten years. One of the Moscow boulevards seems especially favorable to its development. Two brothers, schoolboys, contracted the disease in succession, as did also a fellow scholar who visited their sick room. Appendicitis closely resembles dysentery in its ranging degrees of severity, pathological anatomy, and etiology. The origin of both is probably an autoinfection by the streptococcus, staphylococcus, or the *Bacillus coli* which are found in the healthy individual and which at times assume virulence from causes as yet unknown. Several cases have been reported in which appendicitis has been accompanied by polyarthritis which is a common complication of dysentery and other infectious diseases. This view explains the causations of many obscure cases for which no cause is discovered at autopsy or operation. STEELE.

A Symptom of Tracheal Stenosis. (*Centralblatt für innere Medicin*, January 9, 1897.) By Dr. Aufrecht, of Magdeburg.

In the examination of three cases of tracheal stenosis Aufrecht has observed a symptom of this condition hitherto undescribed. It is that, in such cases, the usual loud harsh bronchial breathing which may always be heard in healthy individuals by placing the stethoscope in the suprasternal notch, is replaced by a soft weak murmur, or respiratory sounds may be entirely absent. The bronchial breathing in this locality is caused by the

vibrations produced in the column of air in its passage through the narrow glottis into the larger tube of the trachea. When the trachea is stenosed this does not occur, and hence the murmur is lessened or absent. Two of Aufrecht's cases were cancerous and one syphilitic, and in all the narrowing occurred in the lower third of the trachea near the bifurcation.

STEELE.

Two Clinical Lectures on Addison's Disease. (*British Medical Journal*, January 9, 1897.) By Byrom Bramwell, M. D., of Edinburgh.

The writer reports three cases of this affection with autopsies, and gives a *résumé* of the literature on this subject. He lays much stress upon the pigmentation of the mucous membranes as a diagnostic point. Case I., male, aged 50. Very rapid emaciation, no abdominal symptoms or vomiting. Profound asthenia. Pigmentation of skin and buccal mucous membrane. Autopsy: old tuberculosis of apex of left lung and recent miliary tuberculosis of peritoneum. Fibro-caseous degeneration of both adrenals. Case II., male, aged 36. Profound asthenia. Pigmentation over the spines of the vertebra and buccal mucous membranes. Much emaciation. Autopsy: both adrenals were reduced to small masses of fibroid tissue. Case III., male, aged 37. History of two years duration of profound and apparently causeless asthenia, slight emaciation and vomiting. Pain in the back, marked pigmentation of skin and mucous membranes of mouth. This case was treated by suprarenal extract, at first subcutaneously with a solution of the dried extract and later with juice of the fresh gland. Marked improvement occurred within a fortnight and continued until a short time before his death, thirteen months later. The cause of death was influenza. At the autopsy, which was performed in the country and not by a trained pathologist, the kidneys were removed with masses of fat adhering to them, which presumably contained the adrenals. Examination of these masses, macro- and microscopic, showed nothing but pigmented adipose tissue, and no tissue consistent with that from an adrenal. Dr. Bramwell concludes from this that these organs had been destroyed by extreme fatty infiltration. He admits the possibility of the tissue examined being merely perirenal fat and that the adrenals had not been removed, but adheres to the diagnosis given above, apparently with very slight foundation for this opinion.

STEELE.

THERAPEUTICS.

The Basis of Sero-Therapeutics in Recurrent Fever. (*Ann. de l'Institut Pasteur*, November, 1896.) By Dr. Gabritschewsky, of Moscow.

There are developed in certain periods of recurrent fever, certain substances actively bactericidal. If, for example, one mixes upon a glass slide

2 drops of the serum containing the spirilli, and 2 of the blood to be examined, it will be observed that, according as the blood to be examined contains more or less of the bactericidal substances, spirilli will exist for a longer or shorter time. This mixture with normal serum permits the organism to live 160 hours; whereas, if the serum is obtained from a patient who has just had an attack of recurrent fever, the organism will become completely immobile and swollen in the course of a half hour or an hour, especially at the temperature of 37° C. This method suffices therefore to obtain the numerical value for the bactericidal action of the blood. For example, for normal serum the period is 160 hours. If anotherr serum should destroy the organism in 80 hours, its coefficient would be 2, and if it only required 2 hours and 40 minutes, its coefficient would be 60. Of course this coefficient is only approximate and the bactericidal action of the blood is always most manifest at 37° C. Observations upon persons suffering with this disease showed that the bactericidal coefficient of the blood is augmented somewhat during the course of the fever and attains a mean value of $1\frac{1}{2}$; until one or two days just previous to the crisis, when it reaches 2. As it increases the formation of spirilli in the blood becomes diminished and they show either weakness or absence of other movements. They became swollen, granular, and less spiral in their outline. It is probable, however, that the destruction of the spirilli does not involve all the germs, so that as soon as favorable conditions again appear, regeneration occurs and there is recurrence of the fever. These favorable conditions consist in the diminution of the bactericidal power of the blood after the crisis. Thus G. has observed in blood with a coefficient of 89 in the course of 2 weeks following the crisis a fall of the coefficient to 7; therefore the formation of the bactericidal substances during the crisis and their disappearance at the approach of the recurrence, are both critical periods in this disease. Two cases that were examined, sometime after recovery, showed very different degrees of immunity. The coefficient in one case being 2 twenty months after his cure, and in another 58 after an interval of 2 years. The latter case had already had 2 attacks. The presence, however, of these bactericidal elements after such long intervals, is supposed to explain the fact that the second attack of the disease is always less serious than the first. Some experiments performed upon monkeys, seemed to confirm these views and he was further convinced of their accuracy after finding that the blood of the guinea pig, that had been injected with spirilli, became actively bactericidal. From a practical therapeutic point of view the following experiments were made. On the 13th of April two monkeys were injected with equal quantities of blood containing spirilli and two days later spirilli were found in the blood of both, and the same day one of them was injected with the blood of a monkey that had already had the disease and whose blood had a coefficient of 10. The next day this injection was repeated and 12 hours later the

temperature was normal, in other words the disease had lasted but 48 hours. The other monkey passed through the disease in the normal time. Both of these monkeys were subsequently frequently injected with spirilli, but neither of them took the disease. G. concludes from these facts, whilst admitting their insufficiency, (1) that the duration of the first paroxysm is shorter if the monkey is treated with bactericidal serum than if it is not so treated; (2) that the spirilli are much less numerous in the blood of the monkey so treated; (3) that these monkeys do not suffer a relapse. As, according to Greisinger, there is no remedy against this disease, he believes that a tentative treatment with the serum of an animal that had become actively immune would be justifiable.

SAILER.

Apropos of the above Paper of Dr. Gabritschewsky. (*Ann. de l'Institut Pasteur*, November, 1896.) By Dr. Metchnikoff.

The experiments of Dr. G. are to a large extent incomplete. In the first place the bactericidal properties of the blood are extremely variable; in the second, there is absolutely no proof of the destruction of the spirilli in the living blood; it is necessary in order to explain the theory, to suppose the formation of spores, and as yet any such formation is absolutely unknown. Further, at the time of the crisis it has been generally found that the spleen is stuffed with bacilli, and, in those animals from which it has been removed, there is an increased number of bacilli in the blood; moreover a portion of the spleen, taken from a monkey cured of the disease, is perfectly capable of giving it to another monkey after the ordinary period of incubation.

SAILER.

Experimental Investigations Upon the Question of Protective Inoculation of Men Against Asiatic Cholera. (*Deutsche med. Woch.*, January 1, 1897.) By Dr. W. Kolle.

Three groups of experiments were made; in the first the protective action of normal human blood serum against experimental cholera in the guinea pig was investigated, and it was found to have practically no effect. Then this same serum was employed after the persons furnishing it had been immunized against cholera. It was found to be actively bactericidal; very minute quantities producing granulation in the culture and protecting the guinea pig against as much as ten times a lethal dose. Immunization was produced in the following manner: a culture of cholera vibrios was sterilized by exposing it to a temperature of 56° C., or to the action of chloroform and injected beneath the skin. Five days later the same dose of a culture containing living virulent vibrios was injected, and five days later a still larger dose of the same virus. In the second series, but one injection of the sterilized culture was employed. In the third series, the

same material was used, but kept for four weeks before being employed. The results of the injection were always the same. In all cases there occurred a local and general reaction such as Haffkine has described. The local appearances consisted of a moderate infiltration and extreme sensitiveness at site of injection and pain upon pressure of the neighboring lymphatic glands. The general condition consisted of a rise of temperature sometimes to 39° C., chills, malaise and anorexia; after three days the reaction was complete. Serum from the persons inoculated was tested at various periods from the sixth day to the end of the year. It is interesting to discover that after the latter interval the protective value of the blood serum was little lower than shortly after the attack of cholera. The specific protective effect indeed did not occur immediately after the injection, in fact it was not evident on the fifth day, but usually reached its maximum on the twentieth day, after which it decreased very gradually. This serum was a specific only against the cholera vibrio and had no effect upon other organisms similar to it. The author concludes from his experiments that it is possible to manufacture a vaccine material on a large scale in laboratories, since the serum that was kept for four weeks was not less effective than that freshly prepared, and that inoculation is extremely valuable in such a population as that of India, where, on account of climate and national characteristics, hygienic protection cannot be carried out.

SAILER.

Study of Ricin and Anti-Ricin. (*Ann. de l'Institut Pasteur*, November, 1896.) By Mr. Stépanoff, St. Petersburg.

After a very large dose of ricin has been injected into the blood, such as 1.5 mgr., the rabbit dies in nine or ten hours, after suffering repeated attacks of diarrhœa. At the autopsy there is found severe anemia and a milky liquid in the intestinal canal, about 30 c. c. in quantity, which could easily be filtered through Chamberland's filter. It was possible with this to produce the symptoms of ricin poisoning in rabbits. In order to determine whether this was really ricin or not, the animal was given large doses of sulphate of sodium, killed, and the intestinal contents filtered and injected as before, naturally without result. Portions of the intestine from the animal that had been killed with ricin were then taken, macerated in a normal saline solution, and this fluid injected. It produced symptoms of ricin poisoning. Excepting the blood and urine, the other organs were completely negative. Experiments were then made with anti-ricin, and it was found present in the blood 24 hours after introduction. Seven days later the traces of anti-ricin had disappeared. [The experiments have apparently been undertaken to prove that the ricin is eliminated by the intestinal tract, as was already generally suspected, but their results entirely inconclusive, inasmuch as the control experiments, performed with the products of the experimental diarrhœa, are absolutely valueless, and it would have been

exceedingly easy to prove, by the injection of the suspected intestinal secretion into an animal immunized against ricin, whether the poison was ricin or not.]

SAILER.

The Antitoxic Unit of Diphtheria Antitoxin. (*Boston Medical and Surgical Journal*, December 17, 1896.) Editorial.

The present extensive use of antitoxic serum in the treatment of diphtheria, and the almost equally widespread ignorance of the significance of the accepted unit of strength, as indicated by letters received from correspondents, makes it desirable to state very briefly what this is. The standard used to measure antitoxic strength was changed several times by Behring in the course of his investigations. With the co-operation of Ehrlich he worked out the comparatively simple but entirely arbitrary standard which is still employed. Ehrlich, now the director of the German Imperial Testing Bureau, whose function it is to test, at the expense of the manufacturers, all serum before it may be offered for sale, has been busy working out a simpler method of standardizing serum, and in October last expressed the hope of soon completing his work and of having it adopted by the German government in place of the one now in use. The strength of antitoxin is at present determined as follows: Diphtheria toxin, the germ-free filtrate of bouillon cultures of the diphtheria bacillus, is injected subcutaneously into a series of guinea pigs of nearly uniform weight to determine accurately the smallest quantity of toxin which is fatal to the guinea pig. When this has been determined the toxin becomes the test-toxin. A given quantity of serum to be standardized is mixed with *ten times the minimum fatal dose* of the test-toxin and injected subcutaneously into guinea pigs of nearly the same weight as those used in standardizing the toxin. If no local edema or infiltration appears, if, in other words, the guinea pig is completely protected, the quantity of serum used contains one-tenth of an antitoxic unit. This is best illustrated by an example: The test-toxin has been standardized and found of such strength that 0.039 c. c. is the minimum fatal dose. The serum to be tested is diluted with sterile normal salt solution until 1 c. c. contains $0.0016\frac{2}{3}$ c. c. serum. The serum and 0.39 c. c. toxin are mixed and injected subcutaneously. If the guinea pig remains permanently well and shows no edema at the place of injection, $0.0016\frac{2}{3}$ c. c. serum contains at least one-tenth of an antitoxic unit. One c. c. would contain at least $\frac{1}{.00166} \times \frac{1}{10}$ or 60 units, that is, enough serum to completely protect every one of 600 guinea pigs from ten times the fatal dose of toxin. In practice a number of guinea pigs are used, since the strength of the serum must be determined after every withdrawal of blood, if, for example, 0.001 c. c. of a given serum failed to protect the guinea pig from death, and $0.0016\frac{2}{3}$ c. c. still permitted a local infiltration with subsequent necrosis, but 0.002 c. c. protected completely, 1 c. c.

of this serum would contain $\frac{1}{0.002} \times \frac{1}{10}$, or 50 units. If, again, 0.001 c. c. of another serum protected completely, but 0.0008⅓ c. c. did not, 1 c. c. of the serum would contain $\frac{1}{0.001} \times \frac{1}{10}$ or 100 units, equivalent to Behring's II. The antitoxic unit may thus be defined as being contained in ten times that quantity of any given serum which is required to neutralize ten times the minimum fatal dose of diphtheria toxin when mixed with the latter and injected subcutaneously into a guinea pig.

CATTELL.

A Case of Scarlet Fever Treated by Anti-Streptococcic Serum. (*Lancet*, January 2, 1897.) By A. Knyvett Gordon, M.B., of London.

A vigorous boy, aged six years, was admitted to the Southeastern Fever Hospital on November 17th suffering from scarlet fever. The patient presented grave symptoms; was semi-comatose, the face pale and respiration stertorous; commencing desquamation on the face, with just perceptible pulse, which, however, could not be counted. For two days the temperature varied from 101.5° F. to 104° F. Two ounces of brandy, with a diet of only milk, was administered. At first there was slight general improvement, but on the third day the patient was much worse. The heart was dilated, and there were well-marked urticarial wheals on the chest and also diarrhœa. Ten c. c. of the *serum anti-streptococcique* of the Pasteur Institute were injected under the skin at five p. m. and the brandy was increased to three ounces. Next day the temperature was 103, pulse 106, and much stronger. Ten c. c. of the serum were again used at noon. On the following day the temperature was 95.5° F., pulse 96 and with much better tension. There was no urticaria and free desquamation. From this time on improvement was steady and in less than three weeks the child was dressed and up. The case is reported as indicating by the rapidity of the improvement the especial value of this serum. After one dose of the serum he rallied when he was apparently moribund and after the second administration the rapid improvement was maintained. Gordon suggests that the use of the serum would be of service in cases of scarlet fever that become septic, whether the signs exist from the first, as in this case, the throat not being severely affected, or whether it is due to absorption from a sloughing throat—a more common event. In the latter case the improvement often begins when the throat is constantly swabbed with chlorinated soda or some other germicide, though the writer does not know of any previous treatment which is effectual when there is septicemia, with even a mild throat. Nor does he consider that the brandy can be regarded in the case here cited as being an important factor in the boy's improvement.

CATTELL.

SURGERY.

A Case of Hospital Gangrene. (*Ann. de. l'Institut Pasteur*, November, 1896.) By M. A. Coyon.

The patient was a groom, who, as a result of trophic lesion following fracture, had suffered recurrent furuncles on the thigh. The lesion consisted of a deep crateriform ulceration, with round elevated walls, surrounded by edematous tissue, in which the lymphatic vessels were swollen. The floor was covered with a grayish-black plastic membrane, exhaling a characteristic putrid odor. The general condition presented marked cachexia. In the floor and in the walls of the ulcer were found numerous long bacilli, sigmoid in shape and forming compact agglomerations corresponding morphologically, and in their staining peculiarities to the bacillus described by Dr. Vincent. It was much longer than the bacillus of glanders, and more sigmoid in shape, and it stained well with the aniline dyes and was decolorized by Gram's. It was impossible to cultivate it, but, inoculated deeply into the thigh of a guinea pig, with closure of the wound above it, it was found to produce an ulcer similar to that found on the patient and containing the same micro-organisms. After the failure of the ordinary antiseptic measures recovery was rapidly effected by the application of bandages soaked in camphorated ether.

SAILER.

A Case of Severe Joint Affection after Scarlet Fever. (*Deut. med. Woch.*, December 24, 1896.) By Dr. Salman, of Osnabrück.

The patient, a young man of 21, was attacked with typical scarlatina, running the normal course and apparently completed in eight days. Four days after the temperature had become normal, he was attacked with a chill and a rise of temperature to 40.3°C.; three days of apyrexia followed, when there was a second chill and a rise of temperature, which continued between 39° and 40° for a month. No cause for the febrile condition could be found, until, towards the end, acute nephritis developed. When this had disappeared however the fever still persisted. Suddenly severe pains developed in the right elbow and the shoulder joint, and, in a few days, these, as well as the wrist in the same extremity was swollen, and painful upon movement. The general condition was very bad. Later other joints were also affected, particularly the right knee and the hip. These were attacked rather suddenly and the whole of the right leg became edematous and excessively sensitive upon the least movement. After this condition had persisted for some time, considerable swelling of the joints was manifest, chiefly peri-articular in nature. At this period death seemed imminent; the fever was high, the pulse small and rapid, the abdomen tympanitic and there were bloody evacuations. There were the *râles* of commencing edema in the lungs, but no albumin in the urine; how-

ever, the general condition slowly improved, while, at the same time, symptoms of severe coxitis developed. Although suppuration did not occur, spontaneous luxation into the ilium took place. In the meantime the condition of the knee improved somewhat, later the coxitis was cured with complete anchylosis, and fixation of the leg in moderate flexion and adduction. The knee gradually assumed the appearance of tumor albus with apparent hyperplasia of the bones entering into the joint. Finally the condition of the patient improved and he was discharged as a cripple. In determining the nature of this case, Salman accepts the classification of infectious arthritis as given by Bokai, that is, the pyemic and serous forms and those due to the penetration of a peri-articular abscess. Among the serous forms are those pertaining to arthritic rheumatism, mono-articular and poly-articular and those that subsequently become purulent. In this case there was multiple joint disease, that in the joints of the upper extremities was serous, perhaps even sero-purulent. In the lower extremities the affection of the right hip and the tumor albus of the right knee was so severe, that it is probable that in both these cases there was suppurative disease. Whether the spontaneous luxation of the left hip was due to the destruction of the end of the femur, the author is not certain; at any rate, in spite of the chronic character in both cases, he is not willing to admit the possibility that there may have been tuberculous infection, particularly on account of the rapidity and completeness of the cure, as soon as the process ceased to progress. An interesting point regarding the etiology of the disease is the extraordinary benefit noted as soon as the salicylic compounds were employed. [It is to be greatly regretted that no bacteriological studies were made in this case.]

SAILER.

Resection of Arteries and Veins Injured in Continuity—end-to-end Suture—Experimental and Clinical Research. (*Medical Record*, January 16, 1897.) By J. B. Murphy, M.D., of Chicago.

As a result of thirty-four experiments performed for the purpose of reaching some conclusion as to the practicability of suturing arteries and veins if these structures should be injured during operative procedures, Dr. Murphy is able to state some new and instructive facts. Dogs, calves, and sheep were used in these experiments, and operations were performed on the larger blood-vessels by many methods, using various materials for suturing. The author found that, for purposes of approximation, veins may be stretched fifty per cent. without passing the limit of their elasticity; and that a large portion of the carotid arteries could be removed and the ends approximated without difficulty.

Coagulation of the blood in a vessel is favored by contact with foreign substances of all kinds, when the blood can adhere to the foreign body, and not unless such condition is present. Blood does not coagulate readily in

contact with bodies covered with fat or vaseline. Waxed sutures, prepared in oxalate of ammonium, should, therefore, be used when the intima of an artery is penetrated. The statement that roughening or irregularity in the wall of an artery would produce coagulation thrombosis only holds good when a foreign body is left in the artery. As a proof of this we have the clinical fact that arteries penetrated by bullets rarely thrombose. The union between the walls of arteries after ligation takes place more rapidly when there is no thrombosis. The necessity for suturing arteries and veins depends upon their individual importance to the tissue on the distal side of the injured part. In the upper extremity, arteries below the brachial; in the neck, arteries above the common carotid need not be sutured. In the abdomen, injuries to the aorta, renal artery, splenic artery, hepatic artery, or to the iliac arteries should be repaired by suture. The greatest need for arterial suture exists after injury to the so-called terminal arteries, but these vessels are the least accessible. A vessel cannot be repaired with safety when more than three-fourths of an inch is removed, except possibly in the case of the vessels in the popliteal space, in Scarpa's triangle, or in the axilla, in which positions postural methods may be employed to relieve the tension. Extensive stretching and denuding is liable to set up an endarteritis. The points to be considered in the operative technique are: first, complete asepsis; second, exposure of the vessel with as little injury as possible; third, temporary suppression of the blood current; fourth, control of the vessels while applying the suture; fifth, accurate approximation of the walls; sixth, perfect hemostasis by pressure after the clamps are taken off; and seventh, the toilet of the wound. The best method by which to control the hemorrhage during the operation is to apply a delicate eight-inch Billroth forceps, with broad blades and a graduated catch with sufficient force to control the hemorrhage and to hold the vessel in the correct position for approximation. If these forceps are not at hand a heavy twisted silk ligature may be used. The best instrument to use to hold the vessel while applying the suture is the small, rat-toothed catch forceps used by oculists and known as fixation forceps. The intima should never be clasped by the forceps, and the ordinary hemostatic forceps should not be used, as it fractures the coats of the vessel. The needles should be the same as are used by ophthalmologists and known as the full-curved, sharp, and round conjunctiva needles. The most serviceable suture material is twisted silk. The needle and the silk should correspond in size, so that the opening made by the former may be filled by the latter. Effort should be made in suturing lateral openings to have the sutures enter only the adventitia and the media, the intima being avoided, as advised by Jassinowsky. The sutures should be inserted every one-sixteenth or one-twentieth of an inch; they should be interrupted; they should enter the vessel one-sixteenth of an inch from the margin of the wound, and they should not include the intima. The danger in penetra-

ting the intima comes from the possibility of endarteritis and obliterating thrombosis. The ordinary double knot should be used, not too firmly tied. When the wound is transverse or irregular, care should be exercised in inserting the needle in parts that belong directly in apposition to each other. If one-half or more of the artery be incised, the first suture should be inserted in the middle of the incision, then one at each angle. After the sutures are all inserted, the compression forceps should be removed from the distal side first. If there should be hemorrhage from the needle punctures, compression with the fingers or sponge for from one to three minutes will be sufficient to control it, as a small thrombus forms in each puncture. When it is possible after the approximation is completed, it is advisable to suture the sheath of the vessel, muscle, or fascia over the line of union, to give it additional support. Gauze drainage should be used which should be removed in forty-eight hours. When more than half the vessel is destroyed it is advisable to resect the injured portion and to produce an end-to-end union by invagination. Two or three double-needled threads are prepared and inserted in the end of the proximal portion of the vessel, including the outer two coats only; these are reinserted at regular intervals from one-third to one-half inch above the end into the distal portion from within outward; the threads are then tied and this invaginates the artery. In order to facilitate the invagination a small incision is made parallel to the long axis of the vessel, extending from one-fourth to one-third of an inch. Four or five interrupted sutures are inserted into the intussuscipiens, binding it to the surface of the intussusceptum, the suture in the latter entering only the adventitia and media. By this method a large surface contact of the vessel is secured and the arterial blood pressure tends to press the walls closer, thus preventing hemorrhage and favoring definitive union. By this method, also, fewer sutures are necessary to secure blood-proof apposition. The veins may be subjected to the same treatment with better results. The indications for operation are: First, injuries to large vessels during operation; second, injuries to large vessels from stab, puncture, bullet or lacerated wounds; third, traumatic or dissecting aneurism; fourth, sacculated, fusiform and arterio-venous aneurism. At the close of the experimental portion of the paper there is a detailed description of two cases in the human being in which blood-vessels have been sutured with good results. The first case was one of perforation of the long saphenous and of the common femoral veins. Both veins were sutured, the vena profunda femoris requiring division between two ligatures before the wound on the posterior surface of the common femoral could be exposed. In the second case there was an arterio-venous aneurism following gunshot wound of the thigh. The vein was sutured and the artery was resected and invaginated.

JOHN M. SWAN.

NEUROLOGY.

A case of Paraplegia due to Spinal Caries: Ménard's Operation. (*British Medical Journal*, November 14, 1896.) By T. Sinclair Kirk, M.B.

The diagnosis of caries of the upper dorsal spine was made in a case in which the symptoms were loss of power in the lower limbs, rigidity, increased patellar tendon reflex, and ankle clonus. There was scarcely any deformity at this time. Treatment by extension failed to benefit the patient and she lost control over the sphincters of the bowel and bladder. When examined later complete analgesia as high as the lower part of the thorax, and almost complete anesthesia over the same area were noted. The anesthesia later became complete. Operation according to Ménard's plan was decided on.

A longitudinal incision, four inches long, was made just internal to the tips of the transverse processes on the left side. The fourth and fifth dorsal transverse processes, their junction with the laminæ and pedicles, their articulation with the ribs, and a portion of the ribs beyond the joints were laid bare. The transverse processes were cut through at their bases and freed from the ribs and removed. The ribs were cut through internal to their angles and the heads and necks removed. The diseased portions of the bodies of the vertebræ were then very easily found, and, when all the carious bone had been removed, a cavity was left which had no firm boundary in front, though behind there was something which was fairly tough, possibly a part of the posterior common ligament. All the bone on the left side was removed, but on the right side part of the bodies was left.

The wound was entirely closed by deep and superficial stitches. Two days after the operation the condition of the bowels and bladder was greatly improved; in ten days the analgesia had disappeared; and in sixteen days the patient could flex and extend her thighs and legs and move her feet. About three months after the operation a jacket with a head support was applied.

At the time the report was made the child, five and a-half years old, could walk; the ankle clonus had entirely disappeared; the knee-jerks were normal; and control over the bowels and bladder was perfect.

SPILLER.

Rapidly Occurring Hemiplegia in Acute Lead Poisoning. (*The American Journal of the Medical Sciences*, February, 1897.) By J. M. Da Costa, M.D.

A woman, previously in perfect health, three days after the interior of her house had been painted suffered from headache, vomiting and right hemiplegia, including paralysis of the right side of the tongue. There was neither wrist drop, nor foot drop, nor tremor, nor atrophy, nor anesthesia.

Four weeks after the paralytic attack the tongue was protruded straight, and the deep reflexes were exaggerated. There were no tender points along the lines of the nerves. A bluish line was observed on the gums and lead was found in the urine. The mother of the patient had a great susceptibility for poisons of all kinds. Under treatment with iodide of potassium and sulphate of magnesium recovery was almost complete. The writer supposes there was some local alteration of the cerebral circulation and effusion, or possibly thrombosis or embolism.

SPILLER.

Rigidity of the Pupil in Hysterical Attacks. (*Wiener klinische Wochenschrift*, No. 52, 1896.) By J. P. Karplus, M.D., Vienna.

Karplus employed a blepharostat and protected the cornea by occasionally dropping a normal salt solution upon it, and was, in this way, able to study the reaction of the pupil to light in hysterical attacks. He produced an attack in a hysterical girl. During the convulsions the pupils were enlarged and rigid, while during the periods of relaxation they were of medium size and reacted. In some attacks when the convulsions were slight the pupils were not rigid. He was able to observe rigidity of the pupils in other patients in hysterical convulsions. Professor Krafft-Ebing and Dr. Bernheimer were convinced of the correctness of these statements.

SPILLER.

A Case of Syphilitic Meningomyelitis and Meningoencephalitis. (*Archiv für Psychiatrie*, Vol. XXIX., No. 1., 1897.) By Alzheimer.

Alzheimer reports a case of syphilis which clinically presented many of the symptoms of general paresis. The optic nerves were affected, but the other cranial nerves escaped. There was none of the variation, therefore, in the degree of paralysis of cranial nerves, which is so characteristic of cerebral syphilis. At the autopsy basal meningitis of a mild degree, with meningoencephalitis of the convexity of the brain and meningomyelitis were noted. It was not surprising, in view of the findings, that the diagnosis of general paralysis associated with spinal syphilis was made.

SPILLER.

A Successful Case of Removal of a Large Brain Tumor from the Left Frontal Region. Opening and Packing of the Lateral Ventricle with Iodoform-Gauze. (*The American Journal of the Medical Sciences*, November, 1896.) By H. M. Thomas, M.D., and W. W. Keen, M.D.

The diagnosis of tumor of the left frontal lobe in this case was based chiefly on the general symptoms of brain-tumor combined with mental dulness, the protrusion of the left eyeball, the slight right-sided facial paralysis, the peculiar uneasiness in the right hand and foot, and the greater degree of optic neuritis in the left eye. Epileptic attacks were absent,

and this fact especially suggested a subcortical location. There was a very slight degree of frontal ataxia. The patient was never guilty of making puns (Bruns).

Dr. Keen operated and removed the second largest tumor he had ever seen. The growth was well defined and was scooped out with perfect ease. The lateral ventricle was unavoidably opened and, in order to prevent the leakage of blood into the fourth ventricle, which would doubtless have produced death, the anterior part of the lateral ventricle was packed lightly with gauze, and in this way it was shut off from the ventricular cavities. The patient made a good recovery from the operation.

The frontal lobe had been extensively destroyed by the growth, and yet after the removal there were few symptoms. Except for the slight remains of the paralysis on the right side of the face, and the symptoms referable to blindness, the boy appeared to be well. It is probable that the tumor displaced the motor region backwards.

SPILLER.

A Case of Primary Acute Encephalitis Hemorrhagica. (*Neurologisches Centralblatt*, No. 1, 1897.) By Dr. Brie.

The patient had had mental trouble for a number of years. Within a few days the following symptoms developed: Loss of appetite, palor, vomiting, headache, fever, stupor, rigidity of the neck, dilatation of one pupil, etc. The disease lasted about nine or ten days. Numerous hemorrhagic foci were found within the cerebral hemispheres. Preparations from the affected parts showed, microscopically, distension of the vessels, engorgement of the lymphatic sheaths with blood corpuscles, small hemorrhages and leukocytic infiltration. Symmetrical portions of the brain, and especially the central ganglia and white matter were affected. The writer thinks that certain cases which appear as atypical forms of typhoid fever, acute delirium, or similar conditions, may be due to acute encephalitis.

SPILLER.

On a Descending Degeneration in the Posterior Columns in the Lumbo-Sacral Region of the Spinal Cord. (*Brain*, Parts LXXIV. and LXXV., p. 333, 1896.) By A. Bruce, M.D. and R. Muir, M.D.

In a case of fracture-dislocation of the twelfth dorsal vertebra, the cord was completely crushed and destroyed in the upper lumbar region, death taking place within five weeks after the injury. Examination was made by means of the method of Marchi. Below the lesion the antero-lateral columns were degenerated, and especially in the area of the crossed pyramidal tracts and the descending sulco-marginal zone of Marie. These degenerations diminished in a descending direction. In the posterior columns there were various degenerations. An area of degeneration was found along the postero-median septum, which in lower regions of the

cord assumed a triangular form. There is no doubt that this degeneration was a descending one, for there were no injured roots below the level of the fourth lumbar segment, and there was no other injury of the cord at its lower end. The authors can not say whether the degeneration was of endogenous or exogenous origin. Their conclusions from this and cases in the literature are:

1. That there is a descending tract in the posterior columns of the lumbo-sacral region.

2. That this tract in the upper lumbar region is somewhat irregularly diffused through the greater part of the columns.

3. That at the level of the third lumbar roots it becomes collected along the margin of the hinder portion of the postero-median septum and the periphery of the inner half of the posterior columns.

4. That at the level of the fourth lumbar roots it extends forward as a narrow band along the side of the septum as far as the posterior commissure. Below this level, at the first and second sacral roots, the tract has the form of a narrow wedge, with its base at the periphery, and its apex at the posterior commissure. Below the third sacral root the tract diminishes in size as far as the coccygeal segment, while retaining its triangular form, and its relation to the postero-median septum.

SPILLER.

On the Condition of the Patella Reflex in Transverse Lesions of the Spinal Cord. (*Archiv für Psychiatrie*, Vol. 29, No. 1, 1897.) By A. Habel, M.D.

Bastian has received the credit of making known the absence of the reflexes in total destruction of the cervical or upper thoracic portion of the spinal cord. Habel gives the literature on the subject to date, and reports twenty-one cases of spinal disease observed by him. One was a case of hematomyelia, with complete destruction of the cervico-thoracic portion of the cord. The patient lived eleven days after a fall and, during this time, the reflexes were absent. The effects of shock usually pass away in five to six days, and the loss of the reflexes may not therefore be attributed to this cause. Bastian's sign was found in eight out of twenty-one cases of compression and traumatic myelitis examined by Habel. In all but one of these cases the compression developed slowly, and the results could not have been due to shock. In three cases examined microscopically the lumbar region and the peripheral nerves were normal. It is not true that the plantar reflex always disappears. There does not seem to be a constant relation between the loss of sensation and the loss of the reflexes. In thirteen cases in which the reflex was preserved there was no reason for believing that total destruction of the spinal cord existed. Habel concludes:

Compression or total destruction of the cervical, upper or middle tho-

racic cord causes a loss of the tendon reflexes with paralysis of bladder and rectum, but no constant loss of the skin reflexes. Compression may cause a loss of the reflexes with preservation or slight diminution of sensation.

Operation is permissible if sensation is preserved. Loss of reflexes with loss of sensation is not necessarily a contra-indication to operation.

SPILLER.

PATHOLOGY.

A Tumor (Hemorrhagic Adeno-Chondo-Sarcoma) of the Anterior Mediastinum Arising from the Thymus Gland. (*Journal of Pathology and Bacteriology*, January, 1897.) By H. D. Rolleston, M. A., M. D.

The patient was a man of 20 years, who was admitted with swelling of face, neck, and left arm; dullness between the sternum and in the left infra-clavicular fossa, near the sternum as far down as the third costal cartilage. There was bronchial breathing near the root of the left lung and enlarged veins over the front of the sternum. The apex beat was felt on admission, but soon ceased to be palpable and the heart sounds became extremely distant. Later there was dullness and loss of breath sounds over the left lung but, as effusion was suspected, parencentesis was performed in the left mid-axillary line and 40 oz. of blood-stained fluid withdrawn from a distended pericardium. This gave relief, but the patient became more dyspneic and dilirious, and eventually died two months after admission. At the autopsy a growth was found occupying the superior and anterior mediastinum and covering over the upper half of the pericardium, to which it was adherent. It measured 7 by 6 inches and extended laterally so as to touch the roots of both lungs. It was smooth and encapsulated nearly throughout, soft in consistency and gave a feeling of semi-fluctuation. Upon section it was found to be composed of two parts, a more superficial stratum, a quarter of an inch thick and excavated into a number of small cysts, which held a colorless fluid containing cholesterin crystals. In the central part was a hemorrhagic new growth, soft and almost diffluent. The glands at the bifurcation of the teachea were not enlarged and, except for a few nodules found in the lungs, there were no signs of metastasis. The superior vena cava was completely obstructed; and in the lower part contained new growth up to the entrance of the azygos veins, so that its walls seemed to be completely destroyed. The other organs appeared to be normal, excepting the testicles, which were atrophic. The microscopical examination showed that the superficial portion was composed of strands of fibrous tissue and unstriped muscle cells enclosing the cysts whose walls were lined by smooth mucous glands, with here and there collections of small round cells. The central part of the tumor was composed of a basis of spindle cells with large irregular spaces filled with blood, and small blood clots

running between the cellular groups; scattered throughout were masses of cartilage. This part of the tumor was distinctly sarcomatous and contained some peculiar cells, possibly of epithelial origin. The tumor is interesting as containing well-formed glands, large polymorphic cells, cartilage, and as arising from thymus gland and containing sarcomatous tissue. The author then discusses the various sources from which the tumor may have arisen. It first occurred to him that it might be a proliferation from a rudimentary bronchus, but the median position of the tumor and the fact that it was not connected with the bronchi led him to dismiss this supposition. He then considered the possibility of its origin from the thymus glands and, although Hassall's corpuscles were not found, nevertheless, from its position and glandular growth, and the association of mucous glands and embryonic connective tissue, resembling therefore, so closely parotid tumors, he was led to accept this view.

SAILER.

Pigmentary Function of the Bacillus Pyocyaneus. (*Annales de l' Institute Pasteur*, November, 1896.) By Dr. Nichol and Zia Bey.

The organisms subjected to the present experiments were remarkable for the intensity of their fluorogescent function and produced a green fermentation upon peptonized glycerine agar. If the culture media contained some potassium phosphate, there was an abundant production of pyocyanin and fluorescent pigment, in the course of 36 hours. If the phosphate were absent, the pigment and pyocyanin formed much more slightly. After bouillon cultures containing this pigment were filtered, the color changed from a green to a grayish yellow, as if there had been a slight degree of oxidation during the filtration.

SAILER.

The Changes in the Diphtheritic Antitoxin Serum when Filtrated through Chamberland's Filter. (*Centralbl. f. Bakt. u. Infektkrank.*, November 25, 1896.) By Dr. L. de Martin, of Milan.

Seven experiments in all were made, the specimens being tested before filtration and then the filtrate tested fractionally. A number of filters were used and several specimens of serum. The author reached the following conclusions: The serum is not only not filtered unchanged, but suffers a marked diminution of its antitoxic qualities and of the solid residue upon evaporation. This diminution is rapid and progressive, so that, particularly the last portion filtered is a colorless, clear, watery liquid almost entirely free of antitoxin and solid constituents. The portion that remains unfiltrated contains correspondingly more antitoxin units and a greater proportion of solid residue. If, however, the portion remaining in the filter be diluted with water and then again filtered, the greater proportion of antitoxin will pass. Different bougies have different degrees of

impassibility to the antitoxin. The greater the potency of the serum the less antitoxin will pass through the filter. The diminution of antitoxin and the solid residue is not proportional, as a matter of fact it is exceedingly variable. As a general conclusion the author very naturally declares, that the filtration of antitoxin serum should be entirely discontinued.

SAILER.

OBSTETRICS AND GYNECOLOGY.

Antiseptic Midwifery. (*Lancet*, January 23, 1897.) By Clement Godson, M.D.

Under this title, in his valedictory address as President of the British Gynecological Society, Godson gives some most instructive statistics showing the remarkable decrease in the mortality that followed the introduction of the free use of corrosive sublimate in the wards of the City of London Lying-in Hospital. From 1833 to 1860 the percentage of deaths occurring from all causes was 3.088 %; from 1861 to 1877 it was 1.696 %; from 1880 to 1897 it was .618 %. During this last period three kinds of antiseptics were used: carbolic acid, permanganate of potassium, and corrosive sublimate. Godson became connected with the hospital in 1870, and since that time it was found necessary to close the hospital three times on account of the alarming mortality. In 1870 the death rate rose to 1 in 19, and the wards were closed for three months and given a thorough overhauling. In 1873 the mortality rose to 1 in 50 and in 1876 and 1870 together it was 1 in 45. They were again closed, this time for sixteen months. In 1880 there was 1 death in 32, in 1882 and 1883 together there was 1 death in 23. In 1884 and 1885 together there was 1 in 48. In the first four months of 1886 1 death occurred in every 44 delivered, and the hospital was closed for six weeks. With its reopening July 1, 1886, the period marked by the use of corrosive sublimate begins. From July 1, 1886, to December 31, 1896, 4,608 women were delivered with only 11 deaths—a mortality of 1 in 419 or .238 %. From January 1, 1892, to December 31, 1896, (5 years) there were 2,392 deliveries with 3 deaths—a mortality of 1 in 797, or .125 %. One of these three deaths was due to an embolus of the pulmonary artery; the other two were caused by puerpural eclampsia. Thus in the last five years there have been 2,392 deliveries without a death from puerpural septicemia.

Hygiene of a maternity hospital depends less upon its construction and age than upon the hygienic principles upon which it is run and the care and thoroughness with which these principles are carried out, and, though undoubtedly cleanliness plays an important part in these results, the wonderfully low mortality must be attributed to the free use of corrosive sublimate for the hands and for vaginal irrigation. Godson has never seen a

case of poisoning result from it, and he believes that its more general use in midwifery would show an immense improvement in the statistics of deaths from septicemia.

L. S. Smith.

Acute Septic General Peritonitis with Septic Metritis treated by Antistreptococcic Serum. (*Brit. Med. Jour.*, January 2, 1897.) By R. R. Law, M.D.

One hour after the first dose, 3 c. cm. of the serum, the temperature and pulse rate had fallen from 101° F. and 116 to 98° F. and 92 respectively and the patient fell into a quiet sleep. The following day four injections of 3 c. cm., each, were given and after that 20 c. cm. were given during the next four days. The symptoms improved steadily and the patient recovered. The immediate effect of each injection was a slowing of the pulse with improvement in its quality.

L. S. Smith.

On some Peculiar Relations of Abdominal and Pelvic Tumors. (*Edinburgh Med. Journal*, January, 1897). By J. Halliday Croom, M.D.

In this article Croom refers "to a series of cases of ovarian, fibroid and other tumors which presented peculiar and interesting relations."

Case I. was that of an ovarian cyst causing a dull area above the umbilicus between which point and the pubes there were clear resonance and tympany. The tumor had a pedicle 10 inches long, was adherent to the anterior abdominal wall and had never caused any inconvenience.

Case II. was an ovarian cyst occupying Douglas's pouch, pushing the uterus upwards and forwards. After opening the abdomen and passing the hand down into the pouch the tumor suddenly slipped up into the abdomen and was removed entire without securing or ligating anything whatever. No pedicle could be found and there was no hemorrhage.

Case III. After the subsidence of an attack of acute peritonitis a small area of dullness between the symphysis and the umbilicus was discovered. It proved an ovarian tumor adherent to the anterior abdominal wall, whose pedicle had been twisted off. The small shrunken remnant of the pedicle was found but there were no indications of any hemorrhage.

Case V. was that of a large cystic tumor of the abdomen that entirely disappeared three days after admission to the hospital. The patient had an attack of very severe pain followed by the passage of an enormous quantity of dark-colored urine.

Case VI. reported in the Transactions of the Edinb. Obstet. Soc., Vol. XIV., p. 97, was a solid tumor about the size of a billiard ball lying free in Douglas's pouch. It had no attachments, required no ligatures and there was no hemorrhage. It proved to be a hematosalpinx. No explanation is offered.

L. S. Smith.

A prolapsed Ovary into a Hernial Sac. (*New Orleans Med. and Surg. Journal*, January, 1897.) By T. H. Watkins.

A right-sided inguinal hernia of six years standing in a patient 33 years old caused her great pain and became red and swollen at each menstrual period. The operation disclosed a cystic ovary the size of a hen's egg. The broad ligament was ligated, the ovary removed, the stump sutured into the canal, and the wound closed.

L. S. Smith.

Tubal Pregnancy in an Inguinal Hernia. (*Münchener med. Wochenschrift*, January 5, 1897.) By Dr. Max Jordan, Assistant in Professor Czerny's clinic in Heidelberg.

The patient, 38 years old, had been married in 1887 and delivered of her first child in 1888. In 1889 she had what was diagnosed as right-sided pyosalpinx. She grew gradually worse and an abscess that pointed over the right Poupart's ligament was opened in 1890 by two extensive incisions. The abscess cavity required two curettings before complete healing followed. As a result of the abscess the patient had two hernial openings, one near the right inguinal canal; the other directly over the symphysis.

In August, 1896, she returned with violent symptoms of acute intestinal obstruction. In the right iliac region there was a small swelling, while in the left extremity of the scar over the symphysis was an apple-sized hernia, irreducible, painful and dull on percussion. The incision laid bare a thick-walled sac which, on being opened, was found to be filled with dark blood coagula adherent to its walls. On cleaning out the coagula a fetus $7\frac{1}{2}$ cm. long and probably 11 or 12 weeks old, was found. Its membranes were also found, lying between coils of intestines deep down in the sac. The patient died the following day with fecal vomiting and increasing cardiac weakness.

L. S. Smith.

Treatment of Climacteric Disturbances following Castration. (*Deutsche med. Wochenschrift*, March 19, 1896.) F. Mainzer, M.D.

This is a report of a case operated upon in Professor L. Landau's clinic, in Berlin. For one year and a-half after the operation the patient had been treated with all the known remedies without any relief, and finally a trial was made of fresh ovarian tissue from cows and calves. The dose was 5 g. (77 grains) twice a day, gradually increased to 20 g. (310 grains), the general condition of the patient and the character of the urine being watched carefully. On the three days before the treatment was begun the patient had respectively 12, 13 and 11 attacks of flushing, palpation, dizziness, and sweating, At the end of three days, during which 35 g. (543 grains) had been administered, the number of attacks had fallen to

five *pro die* and the attacks themselves were much milder. The treatment was continued for 18 days, before which time any temporary stoppage of the drug was followed by an increase in frequency and severity of the attacks. After the eighteenth day the stoppage did not cause any trouble, and the patient was discharged suffering from only four or five light attacks daily that did not cause her any inconvenience.

L. S. SMITH.

Symphysiotomy in the Baudelocque Clinic from December 7, 1895, to December 7, 1896. (*Annales de Gynécologie*, January, 1897.) By Professor A. Pinard.

During this period there were delivered 95 women in whom a contraction of the pelvis was noted. Of these 68 were delivered spontaneously and 27 required operative interference. The operations were divided as follows: Symphysiotomy, 14; forceps, 6; version, 1; cesarian section, 2; basiotripsy with death of child, 3; embryotomy with death of child, 1.

A comparison of the cases shows: (1) The symphysiotomies were practiced on 7 primiparæ and 7 multiparæ; (2) in all the cases the presentation was a head one; (3) the symphysiotomy was performed 13 times for rachitic pelvis and once for a rachitic pelvis with coxalgia; (4) the child was delivered 13 times by means of forceps and once by version; (5) out of the 14 cases 2 of the women and 4 of the children died. Two of these children died of broncho-pneumonia on the ninth and fifteenth days respectively. One woman died of pneumonia on the sixth day and the other died on the seventh day from septic peritonitis. Pinard concludes: (1) that the chances of success are better in women in whom the period of dilatation has been short; (2) that it is not the women in whom the soft parts have been injured that have the puerperal complications, but those that, either multiparæ or primiparæ, at the time of operative interference, have an elevation of temperature as a result of the long duration of labor; (3) if the uterus has been infected, an abdominal hysterectomy is indicated instead of a symphysiotomy; (4) the formulation of an exact rule of indication and contra-indication will be possible only after a comparison of carefully observed cases year by year. This year five women came to be delivered in the clinic who had been symphysiotomied before, but who were delivered this time spontaneously. He is inclined to believe the enlargement obtained by symphysiotomy is not merely a temporary one.

L. S. SMITH.

PEDIATRICS.

I. **Epidemic of Glandular Fever.** (*Arch. of Pediatrics*, December, 1896.) By J. Park West, M.D.

II. **Zur Casuistik des Pfeifer'schen Drusenfiebers.** (*Jahrb. f. Kinderheilkunde*, Vol. XLII., p. 28.) By Dr. Hesse.

III. Gland Fever. (*Med. News*, December 12, 1896.) By Herbert B. Whitney, M. D.

I. West contributes a very interesting paper based on an epidemic extending over a period of three years, affecting ninety-six cases in forty-three families. He has tabulated the entire series in family groups, indicating the number of children in each family, the number affected, the sex, the age, the time of year in which the cases occurred, and their duration. His youngest case was aged seven months, his oldest thirteen years. Children under and above this age who were exposed did not contract the disease. The duration from the first symptom to complete subsidence of the glandular swelling was from nine to twenty-seven days, average sixteen. The period of most active symptoms lasted from four to seven days. The glands did not suppurate and no enlargement remained after recovery. There were no second attacks or sequelæ. There was no vomiting. Constipation was common. Diarrhœa existed in the short mild cases. In severe cases beginning convalescence usually manifested itself by the occurrence of a profuse, greenish stool. Tenderness on pressure below the umbilical region existed in three-fourths of the cases. In eighty-seven cases the liver was enlarged, in fifty-seven the spleen. The urine was scanty and high colored with excess of urates. The respirations were quickened. Severe pharyngitis existed in four cases. In twenty-nine cases there was increased redness of the throat or mouth of short duration and without swelling. The children old enough to do so complained of a "tight feeling," at the top of the larynx. There was some hoarseness, while the glands were more swollen. The pulse in all cases was weak and rapid and remained so for several days after the acute symptoms had subsided. There was no skin eruption. The carotid lymphatic glandular enlargement was the most marked manifestation in all cases. It began after two or three days of malaise most often on the left side and reached its maximum in from two to four days. It occasionally began on the right, but never simultaneously on the two sides. It was exceptionally unilateral. It was an elongated swelling about the size of one's index finger and extended downward and forward from the angle of the jaw. It appeared smooth, but palpitation showed the glands to be separated. The swelling was tender, painful and caused fixation of the neck. The other glands in the immediate region were enlarged, but to less degree. In three-fourths of the cases other lymphatic glands—post-cervical, axillary and inguinal—were enlarged. They were neither as large nor as painful as the cervical, nor were they all enlarged in any one case. In thirty-seven cases the mesenteric glands were palpable. More cases occurred in October than in any other month; the remainder between October and June. The period of incubation appeared to be about seven days. Mumps are excluded because the salivary glands were never involved, because there was no case of mumps during the epidemic. Fifty-

seven of the children had or have since had parotitis and thirty cases occurred before the third year, an age at which mumps is uncommon.

II. Hesse reports three cases occurring as a family endemic, one in a girl of eight and one-half years, the others in boys of three and one-half and one and three-quarter years. The onset in all cases was sudden, accompanied by fever and in one case vomiting; on the first or second day the glands on one or other side of the neck began to swell and were painful to pressure and on movement of the head. The temperature fell to normal on the third or fourth day, unless a new set of glands became involved, in which event the fever was prolonged a day or two. There was no cause discovered for any case. No bacteriological examinations were made. The glandular enlargement, by effecting chiefly the lymphatics posterior to and beneath the sterno-cleido mastoid muscle, rather than the gland at the angle of the jaws, excluded the liklihood of swelling due to diphtheria or angina. The post-cervical glands were somewhat enlarged. There was an insignificant redness of the throat, but no formation of membrane. The spleen and liver were moderately enlarged in two cases and in one decidedly. A peculiarity which especially marked these cases was the appearance of an early nephritis. It was severe in all, and in one hemorrhagic. Hesse thinks that the epidemic character of the cases and the accompanying nephritis determine its infectious nature. He separates it from scarlatina, by the fact that it affected one child who had already had scarlatina by the absence of eruption and desquamation; from influenza by the absence of an epidemic of this condition and by the slight tendency to catarrhal inflammation of the upper air passages. He thinks it possible that the infection might occur through the reddened mucous membrane of the nose, of the palatine arch, or of the tonsils.

III. In this paper three cases of this condition are reported, one in a boy of three years, one in a boy of two, and the third in a girl of two and one-half years. The cases occurred in different families. Other children in these families escaped the disease. In all of his cases the glandular swelling was especially marked "just behind and below the lobe of the ear, so as to form a prominence quite noticeable on simple inspection." The temperature varied from 102° to 104° F. In one case it endured for nine days, in another for about two weeks. Initial vomiting occurred in one case. The glandular enlargement persisted for seven weeks in one case. There was stiffness of the neck and pain on pressure in two cases. There was no cough and no sore throat but the fauces were red. The examination of the heart, lungs, and abdomen was negative. Emaciation and pallor was decided. Anorexia and constipation existed.

S. M. Hamill.

MISCELLANEOUS.

Abstract of an Address on the Spread of the Plague. (*The Lancet*, January 2, 1897, and *British Medical Journal*, January 9, 1897.) By James Cantlie, M.B. Aberd, of London.

Plague or malignant polyadenitis is an acute febrile disease of an intensely fatal nature, characterized by inflammation of the lymphatic glands, marked cerebral and vascular disturbances, and by the presence of a specific bacillus. The basin of the Mediterranean and the strip of country which runs parallel to that sea across the Asian continent from Turkey to China may be roughly taken as its habitat during the nineteenth century, but the Mediterranean part of the belt has disappeared almost wholly within the present generation. The animal which above all others is known to be affected by plague is the rat. Pigs, dogs, snakes, jackals, and pigeons are affected by a fatal malady whilst plague is epidemic among human beings. None of the purely herbivorous animals, such as horses, donkeys, oxen, sheep, goats, or rabbits, are affected. The evidence in regard to the presence or absence of *pestis minor* may be summed up as follows: (1) a fever associated with glandular enlargement, a "benign polyadenitis," is an established disease; (2) it may exist independent of the plague, or malignant polyadenitis; (3) the two may coexist. Concerning infection and contagion it may be stated: first, that the rat is the animal most likely to be attacked by plague; second, that rats suffering from or dead of plague may infect other animals, such as snakes and jackals, which have consumed them; third, that rats are always affected by a disease similar to plague at the same time that man suffers; fourth, that the rat may infect men, but the means of conveying the contagion is not known; fifth, that during the prevalence of benign plague (*pestis minor*) rats do not die. The incubation period of the disease is from three to six days. Plague is due to a bacillus which was discovered independently by Kitasato and by Yersin. Dr. Yersin found that a bacillus in some respects resembling the appearance of the bacillus found in the human body in plague was found in the soil of Hong Kong during the plague epidemic there. These two bacilli occasionally behaved similarly in culture experiments. Cultures made from the soil bacilli possessed no virulence when injected into mice or guinea pigs. Cultures of human plague bacilli also vary in virulence. This organism is a diplobacterium, and is found in the blood and in the tissues. Plague is infectious chiefly by dust which arises during the cleansing of dwelling houses which plague patients have occupied. Plague is contagious by prolonged and intimate contact. A bacillus is reputed to be found in *pestis minor* which is of somewhat similar appearance to that of malignant polyadenitis. These bacilli differ in their toxic powers only. The bacillus of the benign variety attains malignancy by passing through some intermediate host, possibly, but not probably, the rat.

JOHN M. SWAN.

A Few Practical Hints to Medical Men on the Preservation of Their Own Health. (*British Medical Journal*, December 19, 1896.) By John W. Teale, M.A., Oxon., F.R.C.S.

In an address delivered at a meeting of the Leeds and West Riding Medico-Chirurgical Society, by Dr. Teale, the speaker enumerated some very practical and valuable suggestions for the use of the profession in the conservation of their own health. First of these is the power of concentration, by which the speaker meant the power to abstract his thoughts from all previous impressions, the better to centre them on the case before him. Patients are peculiarly sensitive to any appearance of pre-occupation in the physician's mind. This power, with the scarcely less important faculty of commanding one's temper, is a potent factor in the treatment of exacting patients, and is to be attained only by the most steadfast self-control begun in early life. An equable temper thus gained will fit the professional man to cope with cases in the sick room that will try the strongest nature. The doctor thinks that these mental states are best attained by simple, healthy outdoor life, as far as possible, in constant physical training, and he sees no reason why the athletic vigor gained in youth should not remain in mid-life, or even old age. A man need not necessarily become stout and short of wind before he has reached fifty. If he does, it is because his physical condition is not fit to grapple with his life work thus late. Assuming that a man is physically sound and has cultivated exercise in youth, it is surprising how easily this can be maintained provided regularity is observed. It is a mistake to suppose that the busy man requires much exercise. His ordinary day's work is usually enough for him. It is well to practice the habit of sleeping for a few minutes at any time. Men can live only on the interest of their vitality: the principal should be kept intact. For a sound man everything that is good is wholesome, taken at proper times and in proper quantities. The stomach should be trained to understand that within this limit all good food well cooked is legitimate. After thirty a man needs only such an amount of food as will maintain his weight. If too busy to dine, a cup of soup, or a sandwich and a glass of wine is better than a full meal. The fewer the meals the better the health. The speaker suggested that spirits are unnecessary at bed-time or between meals; 365 glasses of whiskey a year at retiring is a needless tax on the liver. A fairly healthy man may have a daily cold bath, and the required reaction may be secured and maintained by a fire in the room or a hot bath towel; this, followed by the reasonable use of Indian clubs, will enable him to face any weather. The same underclothing is recommended in all seasons; the only change being in the outer garments. If chilled during a long drive in the open, walk the last mile or two, retaining your wraps to restore the circulation. If called at night for a long ride in a winter's cold, try to have a fire in your room and a light hot meal; with this you may defy the elements. A fire is

recommended whenever it can be endured — even in the drear, thundery weather of summer. No medical man should keep a bad tooth in his head. Disaster is almost sure to follow such a course. The teeth should be regularly inspected by a dentist before going upon his holiday. Every medical man should have his regular outing. While much value is placed upon golf and cycling, fly-fishing is considered by far the best of all out-door sport for the building up of the strength so essential to the over-worked physician. The exercise is gentle and varied, the interest great, and is to his mind much better than hurrying half over Europe in a closed railway carriage.

CATTELL.

BOOK REVIEWS.

AN AUTUMN SINGER. By George M. Gould, A.M., M.D. Philadelphia, J. B. Lippincott Company, 1897.

To unite medicine and poetry should never be thought incongruous, for none see more clearly than the doctor the real joys and sorrows, the beauty and repulsiveness of life. Perhaps his tendency is rather towards a morbid pessimism—the gloom of the overworked—and it is all the more gratifying when one finds a worker like Dr. Gould, in "An Autumn Singer," turning from the disease-ridden world and its problems to the bright fields and flowers, from sick humanity to the wonderful health and spirits of the animated world. The lover of poetry will find many good things and perhaps some grand things in Dr. Gould's book, though he undoubtedly will dislike certain other things—every man to his taste, but always and ever it does the heart good to find a professional man shaking off the trammels and chains of his fettered life and at least trying to soar above his germ-laden atmosphere to the purer air above, where the singer lives and sings. EDWARD WILLARD WATSON.

OVER THE HOOKAH. The Tales of a Talkative Doctor. By G. Frank Lydston, M.D., Fellow of the Chicago Academy of Medicine, The Southern Surgical and Gynecological Association, etc. Chicago, Fred. Klein Company, 1896.

This is not a volume of verse, though many verses generally in praise of tobacco are scattered freely through its pages. The book is one long everlasting talk of a loquacious doctor, who talks in all dialects, or makes his characters do so, which is much the same thing, Southern dialects, Western and Uncle Remus' dialects, jargon of the prize ring, political patter, any and every thing. The book is intended to be intensely humorous and it has almost succeeded. Any way, when medical fun of the generally published kind is so loud and broad, it is refreshing to meet professional jocosity so modern, so refined and subdued that no blush at its innuendoes can ever discolor with its aniline hue any living cheek, to say nothing of the sallow and withered cheek of the modest and retiring dead.

The book is not the production of a polished scholar, it lacks some of those important gifts that have made famous the names of eminent humorists. We

miss that subtler element of the incongruous and unexpected, that fine combination of the gentleman and the boor, that is known as distinctively "American humor," but it is readable from its opening page to its final leaf; one can read on and on—shrewdness and kindness and a sort of imagination of the Archeological-Museum kind which has stored itself full of threadbare situations and has pieced together Old Joe Millers—the legs of one article fish-glued into the head of another—thorough acquaintance with the dull routine of the general practitioner—in many parts of our wide extended land, all make a fascinating whole—and through the final chapters stalk our old friends, Gentleman Jim and Major Merriweather—the one, the typical western desperado—there never was but one—though the vivid western imagination has converted him into a regiment; —the other, the Major—strangely familiar to us on other pages—the same yet not the same old friend—transplanted a few thousand miles west, that well-known southern character—the joy of the crossroads and the country bar-room, has at last blossomed out to his last petal and happily died.

Read "Over the Hookah"—you will feel while immersed in its beautifully illustrated pages at home in a pure medical air, and when with a sigh you close the book, you will wake again in the rough unmedicated outside world to which you are only a dispensary or hospital addendum, or a creature whose services to humanity are too cheap at your own valuation to be worth anything at all.

EDWARD WILLARD WATSON.

THE PRINCIPLES AND PRACTICE OF MEDICINE. By William Osler, M.D. Second edition. D. Appleton and Co.

The second edition of Dr. Osler's practice contains sixty additional pages of reading matter, and some good new illustrations; it is fully abreast of the times, and the most important medical discoveries in the past three years receive careful consideration and analysis.

There is not found in this volume much that is entitled to criticism, the reviewer is much more inclined to praise it. The author in his preface tells us that many of the articles have been partially or entirely rewritten, and that new matter has been added to other chapters. The article upon diphtheria takes up the bacteriological aspect in detail, with the antitoxin treatment; Dr. Osler believes in the efficacy of antitoxin; he emphasises that where no bacteriological examination can be made of doubtful cases, they must be treated with all the care of true diphtheria, especially in respect to isolation. His article on appendicitis will please our surgical brethren, for he turns his cases over to them at once, believing that the treatment needed is usually operation, though he does not believe by any means that every case demands surgical interference. He is also opposed to the use of an initial purge in this disease, and, in fact, in all inflammatory conditions involving the peritoneum.

The reviewer has read with both pleasure and profit the articles on typhoid and malarial fever; the conclusions in both these articles are largely based upon Dr. Osler's own work and experience in these diseases; his views are, therefore, entitled to more than ordinary consideration. The section on Diseases of the Nervous System is made more acceptable to the student by some new and good diagrams. There is also a new Section on Affections of the Mesentery, and a short description of the Bubonic Plague and Foot and Mouth Disease.

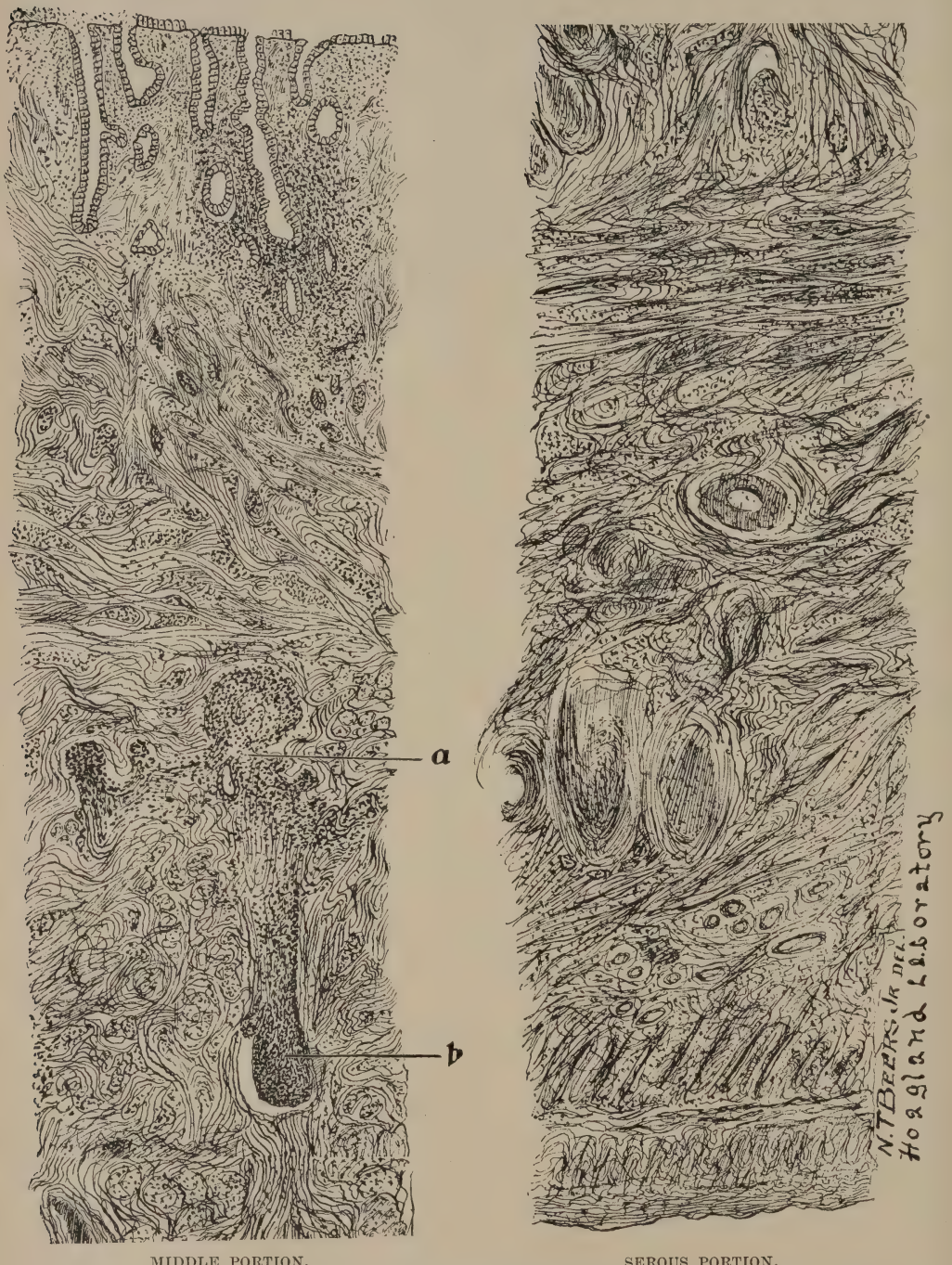
The book is replete with accurate pathological descriptions and rational and sound advice as to treatment; it is prolific in reference to the best and latest medical literature, and it gives credit where credit is due, though the writer is forgotten or unknown by the younger generation of physicians. In short, this work meets the demands of the diligent student and the conscientious and scientific physician. It deserves the success it will again meet. J. A. S.

A Guide to the Clinical Examination of the Blood, for Diagnostic Purposes. By Richard C. Cabot, M.D. William Wood & Co., New York. One Vol. Pp. 396.

The appearance in English of a work devoted to the blood, even though restricted in its scope, is a cause for general rejoicing among both practitioners and students. Apart from the superb treatise of Stengel in the Twentieth Century Practice this is the only modern work in English devoted to the blood. The scope of this volume has, however, been limited by the author to the clinical aspects of the blood, a plan which has disadvantages as well as advantages, since clinical cannot be successfully carried out without clear ideas on physiology, a broader consideration of which, we think, ought to have been incorporated into this work. We miss, in particular, an adequate discussion of the liquor sanguinis, of the relations of it and the corpuscles to the lymphatic and alimentary systems, and of the chemical methods applied to the study of them, for it is surely along the line of chemical and micro-chemical work that the advances of the future must be made.

Part I. of Book I. is devoted to the methods of examination and is complete as far as it goes. The author justly insists upon the wide range of error in the use of the hemoglobinometer of Fleishl, a matter not fully realized by many who use it; and the suggestion to substitute for it the estimation of the specific gravity of the blood ought, at least, to have the effect of calling more general attention to the great value of this estimation, which is, however, much more accurately determined with the picnometer than by Hammerschlag's method. We regret that the author describes only the Ehrlich triple-stain. Certainly other methods are as necessary to the student as they are to the independent worker; also that there is no consideration of the alkalinity of the blood. Part II. is devoted to the physiology of the blood, and is the least satisfactory chapter in the book in that the author has limited himself to the morphology with a total ignoring of the chemistry. The descriptions are clear and accurate. Part III. is devoted to the general pathology, and is a noteworthy chapter, leucocytosis being especially well considered. It was, doubtless, only the intention of the author to keep out of the book all controversial matter which prevented him from saying that the necrobiosis of Maragliano has not the importance attached to it by its discoverer, and that the eosinophilia theories of Neusser contain some absurdities and many assumptions. We do not think that our neurologists and surgeons will concede that "in determining whether a given case of hysteria, neurosis or psychosis is likely to be benefited by castration the presence of eosonophilia favors the operation." Book II. comprises the major portion of the volume and is devoted to the special pathology of the blood. This is splendidly written throughout and contains a summary of the blood changes in all local and general diseases as well as in the secondary and primary anemiæ. The work of other investigators is most widely quoted, but the very numerous and thorough studies of the author are upon every page and deserve unreserved praise and admiration.

The illustrations throughout the book are very good, and an especially valuable feature is the extensive bibliography attached. We hope this work will receive what it deserves, a place in the library of every physician and student. The book is well printed, in large type, upon good paper, and is well bound. Taylor.



Section through corpus uteri of Dr. Jenett's case including all the structures. The endometrium is in hyperplasia. At *a* and *b* are seen portions of characteristic tissue of the endometrium which are seen to lie deep down in the muscularis, and near large bloodvessels.

INTERNATIONAL
MEDICAL MAGAZINE.

Vol. VI.] APRIL, 1897. [No. 3.

ORIGINAL COMMUNICATIONS.

MALIGNANT CHRONIC ENDOMETRITIS.[1]

By J. M. VAN COTT, Jr., M.D.

Professor of Histology and Pathology at Long Island College Hospital; Pathologist to Long Island College Hospital, Brooklyn Hospital, and Kings County Hospital; Director of the Department of Pathology, Hoagland Laboratory.

It is open to debate whether or not the title selected for this brief paper be correctly applied, but its choice has been governed by the constant relationship between the two conditions of inflammation and hyperplasia of the endometrium. Olshausen[2] has described the condition to be discussed under the title "Endometritis hypertrophica s. fungosa," which is similar to what Abel[3] describes, and is characterized by profuse proliferation of gland structure, together with multiplication of capillaries in the endometrium.

Amann[4] describes it as follows: "The characteristics of these benign hyperplasiæ of gland elements are the facts of their superficial proliferation and the limitation of the growth to the tissues of the endometrium."

The same author further states that "aside from these benign alterations the surface proliferation of glands can, in rare instances, exhibit malignant disease, *i. e.*, through transformation into adenoma, whereby one gland lies under another, with but little interstitial tissue, the progress of the growth being outward into the musculature."

Orth[5] has practically described the same thing when he says: "The finding of gland tubes lying closely together, particularly when they lack the normal boundary of a tunica propria and longitudinally-disposed mus-

[1] Paper read before the Philadelphia Pathological Society, October 22, 1896.

[2] Olshausen, cit., Karl Abel "Die mik. Technik u. Diagnostik in der gyn. p. Praxis. Berlin, 1895.

[3] Abel. Vide, Supra.

[4] Amann, Josef A., Jr. Lehrbuch der mik-gynekolog. Diagnostik, Munich. 1896.

[5] Orth, Johannes. Allg. Path. 7 Edit. p. 483.

cle fibers, is sufficient for the diagnosis of a malignant neoplasm, which indicates hysterectomy."

Julius Schwalbe[1] has given a capital description of the lesion under title of "Malignant adenoma," as follows: "A particular form of malignant new formation is the malignant adenoma—the gland carcinoma of the corpus mucosa. It consists in excessive development of the glands of the uterine mucosa, which leads to complete disappearance of the interstitial tissue of the endometrium and to gland formation at the expense of the muscular tissue of the uterus.

"Even though metastases never occur in this form of malignant growth, its viciousness is evidenced, first by the fact of repeated and unfailing recurrence after removal of the degenerate mucosa with a sharp curette; second, that this growth induces progressive destruction of the uterine parenchyma; (See frontispiece) and third, that clinically, through persistent hypersecretion (brought about by gland hyperplasia), and through extreme metrorrhagia, in the end cachexia and death supervene." "Typical carcinoma may also develop in the new-formed glands."

"The diagnosis is constituted by microscopic examination of curetted masses."

Schwalbe further says: "When in the further course of the case its recurrent nature is shown, *i. e.*, that a malignant adenoma is at hand, hysterectomy is indicated." A good deal is being said and written upon this subject at present; and the gynecologist is expecting more and more from the pathologist in point of differential diagnosis in all conditions involving hyperplasia of tissue in the female genito-urinary tract.

The average surgeon is not aware of the difficulties to be overcome by a microscopist in the successful examination of material dispensed to him by the surgeon's hands; for the reason, that he is too busy to become proficient in laboratory methods. Every one who has had much to do with microscopic diagnosis has discovered this. But, assuming that material be furnished for examination in proper preservation, and from the right location, I would like to ask the question of those here whether it be possible, in their judgment, to find this condition with any degree of certainity *intra vitam* by means of miscroscopic analysis of the products of the curettage?

I would put the question in this way:

1. Can the diagnosis be made microscopically?

2. If so, can it be made before widespread adenomatous change has occurred?

3. If the microscope alone is incompetent, is there any combined method by means of which reliable results may be looked for?

In spite of the justice of the view, that to remove an uterus unnecessarily is a grave error, it has always seemed to me that to fail to remove it, the necessity being at hand, would be an even graver error.

[1] Schwalbe, Jul. Grundriss der spec. path. Anat. p. 524. Berlin, 1892.

Statistics and experience are teaching us constantly that conditions supposedly insignificant will some day assume grave proportions, and nowhere more than in the very class of cases under consideration. My own view of the matter after six years of observation is, that the microscope alone is not competent to determine the diagnosis of this form of malignancy *in utero*. While a great deal may be determined regarding the given case in point of the hyperplasia, the rapidity of cell proliferation, and the presence or absence of adenoma; it may be impossible to say whether or not the process is a superficial one, or already deep-seated, involving the inter-muscular septa of the metrium.

Certainly the presence of mitosis, while it proves active proliferation of cells, will not show in curettings the location of the hyperplasia, nor will the general facts concerning the cells in their relation to each other do it. At best there can only be a strong suspicion of the presence of a condition which may prove fatal long before the morphologic changes are so clear as to leave no room for discussion or doubt as to their nature.

My own observation has extended over about a half-dozen cases in as many years of pathological work in three hospitals in Brooklyn; and in one only of the six was I able to complete the investigation by examination of the enucleated organ. This statement is made for the purpose of emphasizing my belief in the comparative rarity of the cases.

With your indulgence a brief history of this case will be given:

The patient was aged about fifty, short, and very stout, with flabby tissues, and rather anemic. Her uterine history was that of profuse metrorrhagia extending over a period of five years, and also of increasing amount and duration, and lessening intervals. Repeated curettage was followed by recurrence of metrorrhagia and profuse muco-serous discharge *ex utero*. Microscopic examination of the curettings revealed an apparent simple gland hyperplasia; and report was based upon the findings, with the request that, if curettment were repeated, more of the material be submitted for examination. In the course of a few months more curettings were sent, in a very fresh condition; and, after careful hardening, were sectioned, stained, and again examined microscopically with the same result, *i. e.*, simple gland hyperplasia.

In the report upon this second curettage I stated it as my belief that this was a case of malignant hyperplastic endometritis, advised another examination of material in case of necessity for a third operation; and suggested that if the findings on examination of the third specimen remained unchanged the case should be regarded as a good one for hysterectomy.

Not to absorb too much of your time—the case was operated upon, and I am able to show you sections through the wall of the uterus, and to describe its condition as follows:

The gross examination of this organ revealed it to be decidedly enlarged and somewhat globular in shape, with a relatively short cervix.

The perimetrium is smooth, glistening, and everywhere hyperemic. Pressure conveys the sense of softness, and some elasticity. On gross section the cut surface is slightly rough, and appears everywhere hyperemic, especially in and near the endometrium, which is considerably engorged with blood and hemorrhagic in spots.

Total thickness of uterine wall from surface of endometrium to surface of perimetrium a full inch and three-eighths. The endometrium is soft and velvety in feel, and apparently one-fourth of an inch thick.

For microscopic purposes thin portions of tissue were cut with a large, sharp knife about one-eighth inch thick and one-half inch wide, stretching through the peri- and endometria, at a point just below the cornea. These were at once immersed on flat blotting paper into 95 per cent. alcohol; and, after hardening, imbedded in celloidin, and sectioned on a Thoma microtome, and stained with hematoxylon and eosin, and mounted in xylol balsam. There was marked shrinkage of the tissue in the alcohol, especially of the endometrium.

The microscopic findings are quite in keeping with those of the curettings. There is no traceable evidence of either carcinoma, sarcoma or adenoma; but everywhere is evidence of gland hyperplasia, not extreme, but showing the distinct tendency to outward growth into the intermuscular spaces of the metrium. An interesting occurrence is the growth of the *matrix* of the endometrium far into the metrium. This is not described in these conditions in the various reports of them that I have been able to examine. I believe that I have seen areas of this portion of the endometrium growing very close to the perimetrium, and am now engaged in an effort to find a differential stain that will help to prove the correctness of this finding.

The general impression conveyed by the microscopic findings is that of a progressive *outward* hyperplasia of the corporeal endometrium. This hyperplastic tissue is evidently displacing and replacing the muscular tissue of the metrium, and its proximity to the blood vessels must be regarded as a possible source of the metrorrhagia.

When the honor of an invitation to read a paper before this Society was extended to me, I made up my mind to bring this matter up before it for the benefit to be gained from the experience of its members concerning it.

You will all doubtless concur in the proposition that, notwithstanding the difficulties and often impossibilities in the way of forming any kind of reliable conclusions from the examination of uterine tissue removed for purposes of diagnosis, it is nevertheless the duty of a pathologist to "stand by his guns" in such cases, in the hope of discovering and possibly routing the enemy.

After mature deliberation my personal belief is that the diagnosis of endometritis chronica malignans cannot be positively made in the present state of our knowledge by means of the microscope alone; but that with the combined microscopic examination of the curettings and a good clinical history it can be determined.

Wm. Hunt

MEMOIR OF WILLIAM HUNT, M.D.[1]

With unpublished letters from Oliver Wendell Holmes and D. Hayes Agnew.

BY THOMAS G. MORTON, M.D.,

Philadelphia, Pa.

In former times it was the custom, more so than it is at present, for students while attending lectures at the medical schools in Philadelphia to join one of the so-called "Quiz" classes, which would assemble at some convenient place where examinations would be held upon the lectures of the day. Many years ago, I was invited by a friend and fellow-student to accompany him to one of these exercises, which happened to be on anatomy. I did not know the Quiz-master personally, who he was, or even his name; but his pleasant and kindly manners, together with the great interest he appeared to take in the individual members of the class, attracted me, and before the hour was over I resolved to become a member of the class. I did so, and thus began my acquaintance with William Hunt. Our acquaintance gradually ripened into friendship, and this into genuine regard, affection, and love. This relation between Dr. Hunt and myself, so happily inaugurated, continued without the slightest interruption until his death, in 1896, a period of more than forty years.

It is, therefore, to me a source of more than gratification that the College of Physicians and the Academy of Surgery have invited me to prepare a memorial of our late fellow member and ex-President, with whom I had been so pleasantly and constantly associated during, I may say, my entire professional life.

William Hunt, the son of Uriah and Elizabeth Shreve Hunt, was born September 26, 1825, at 106 North Fourth Street, Philadelphia. He was descended from a long line of Friends (Quakers), his great-grandfather, William, having been widely known as a preacher, both throughout this country and abroad, during the early half of the last century. The family first came to America about the year 1680. Doctor Hunt's great-great-grandfather, with his four sons, came from Scotland and settled in New Jersey and Pennsylvania, whence they emigrated to North Carolina. In 1815, Uriah Hunt left North Carolina to make his home in Philadelphia, where, as he says, he found that, at that time, "there were not twelve of the name in the Directory." He established himself as a publisher, especially of religious works and text-books for schools, and became a successful business man. He was a highly respected member of the Society of Friends all his life.

Doctor Hunt's mother was a daughter of Caleb and Margaret Donaldson, and a granddaughter of Arthur Donaldson, of Revolutionary fame. William Hunt, by descent a member of the Orthodox branch of the Society

[1] Read before the College of Physicians, of Philadelphia, February 3, 1897.

of Friends, was disowned in 1843, because he acted as groomsman at his sister's wedding, when the latter married a member of the Hicksite branch of the Society. He married, on June 3d, 1856, at No. 185 (now 515) Arch Street, Rebecca T., daughter of Richard and Lydia Williams Price, and at once commenced practice at his residence on Arch Street, below Fifth, then No. 143. They had two sons—William, Jr., and George Wood—both of whom survive him, and one daughter, Margaret Price; the early death of the latter, in 1872, was a source of great grief to the parents.

Doctor Hunt's early education was received at the Friends' Select School, but on account of delicate health, at that time, he was unable to enter college. He completed his education under home instruction, after which he entered his father's publishing house, on Fourth Street below Arch, where he remained one year. As mercantile life was utterly distasteful to him, his business career was brief. His father finally yielded to his earnest desire to devote his life to medicine. He accordingly entered the Medical Department of the University of Pennsylvania and was graduated in the class of 1849, during which time he was a student in the office of Doctor George B. Wood. His thesis was upon the "Treatment of Aneurism."

Immediately upon receiving his degree, he was appointed as substitute for Dr. Spencer Sergeant, who was then a Resident Physician at the Pennsylvania Hospital. While still acting as substitute, he was elected to succeed Dr. Sergeant, whose illness had proved fatal. It was during his two years' term of service at the hospital in this capacity that he had a severe attack of typhoid fever, and he frequently stated that his was the only case then on record of recovery after a perforation of the intestine. Dr. Geo. B. Wood, in referring to Dr. Hunt's illness, wrote that during the course of the disease, he "was suddenly attacked with violent pain in the right iliac region, extending over the right side of the abdomen, with great distension, exquisite tenderness on pressure, and extreme frequency of the pulse. It was the opinion of Dr. Gerhard, who was the attending physician, and my own, that perforation had taken place."[1]

Doctor Hunt, in one of his clinical lectures, incidentally alluded to his own case, using the following words: While a Resident Physician in 1850, in the Pennsylvania Hospital, I had an attack of typhoid fever which became historic, and was a theme for medical lecturers in their clinics for many years. I had, according to the opinions of most distinguished attendants (Doctors Wood, Gerhard, and the elder Pepper), every symptom of having perforation of the bowels. The accident was made out completely, but I treated science so disrespectfully as to get well, and so gave no opportunity to confirm the diagnosis."[2]

[1] G. B. Wood's Practice of Medicine, Vol. 1, p. 393, Philadelphia, 1866.

[2] Clinical lecture on "Injuries to the Spine," November, 1881, *Medical News and Abstract.*

Doctor Hunt became Assistant Demonstrator of Anatomy in the University of Pennsylvania under the late Joseph Leidy, and, upon the latter being made Professor of Anatomy, Doctor Hunt was appointed Demonstrator, in 1854, which position he held for ten years. The warm friendship and intimacy between Professor Leidy and Doctor Hunt were terminated only by the death of the former. It was most fittingly commemorated by Doctor Hunt's two addresses, one upon the "Personal History," and the other upon the "University Career," of Doctor Leidy, the former being delivered before the Academy of Natural Sciences of Philadelphia, May 12, 1891, the latter before the Alumni and Students of the Medical Department of the University of Pennsylvania, on November 17, 1891.

During two of the years of Doctor Hunt's demonstratorship, I was his assistant in the dissecting rooms.

After the work in the rooms was concluded, each night, Dr. Hunt and I would adjourn to a neighboring German restaurant and spend a half hour in social chat on matters of mutual interest, both professional and personal. I now look back upon that period as a most enjoyable part of my professional life.

Dr. Hunt was elected to the surgical staff of the Episcopal Hospital in 1853, where he served ten years. During part of this period (from 1857), he served at Wills' Hospital for the Indigent Lame and Blind. He resigned from both the Episcopal and Wills' Hospitals upon his election to the staff of the Pennsylvania Hospital, as one of the attending surgeons, in September, 1863. In the latter position he served continuously for thirty years, becoming Senior Surgeon of the Staff upon the death of Dr. George W. Norris, in March, 1875.

Among the seventy-two members of the medical and surgical staff of the Pennsylvania Hospital from its organization in 1750 to the present day, a period of nearly a century and a-half, only three served longer than Dr. Hunt: Dr. Thomas Bond served thirty-two years, Dr. Thomas Parke forty-five years; my own record is thirty-three years this month.

It was formerly the custom of the surgeons of the hospital to go on duty, in rotation, for three months each year. Believing it better for the surgical work to have a more continuous service, Dr. Hunt suggested changing the period to six consecutive months, two of the surgeons being on duty at a time, a plan which was adopted about 1870 and which has been since continued. Dr. Hunt was consulting surgeon to the Pennsylvania Institution for the Deaf and Dumb, and attending surgeon to the Orthopedic Hospital. From the latter he resigned in the fall of 1889. He was appointed one of the Governors of the Gynecean Hospital of Philadelphia in 1889.

Dr. Hunt became a member of the American Medical Association in 1852, and a Fellow of the College of Physicians in 1854; he was elected

a member of the Museum Committee in 1857, curator in 1858, a member of the Mütter Museum Committee in 1863, temporary curator in 1874, and Chairman from 1879 to 1895. He became a member of the Academy of Natural Sciences in 1855, of the Philadelphia County Medical Society in 1876, and a Fellow of the Philadelphia Academy of Surgery in 1879. He was President of the last-named from January, 1891, to January, 1895. On his retirement from office the thanks of the Academy were tendered him for his faithful and valued service and his considerate and courteous performance of his duties as presiding officer. He was a Trustee of the University of Pennsylvania from 1879 to 1895, and he was elected an honorary member of the American Surgical Association in 1882. He was also a Director of the Philadelphia Contributionship, a fire insurance association, from 1882 to 1895. He was elected a member of the Society of the Sons of the Revolution in 1890. In the records of that Society it is noted that he was a great-grandson of Arthur Donaldson, who was engineer in charge of the defences of the Delaware River during the Revolutionary War.

Doctor Hunt was one of the original incorporators of the Microscopical and Biological Section of the Academy of Natural Sciences, and in its early days was one of the most active members. He was a member of the Alumni Society of the Medical Department of the University of Pennsylvania; of the Historical Society of Pennsylvania and of other organizations. He was one of the original members of the former Biological Club of this city, and this body merits a few words of digression.

The "Biological Club" was a social organization formed among the members of the Academy of Natural Sciences about 1859, during the time of activity in the Biological Section. The meetings of the club were held in rotation at the residences of the members, were very informal, and, at first, the refreshments consisted of crackers and cheese and ale. The rigid sumptuary laws of the early days, however, did not last; the simple fare expanded into a supper, to be succeeded about 1870 by a dinner. For over thirty years the club continued to meet regularly, without the loss of a member, thirteen members being generally present. It finally dissolved, principally owing to losses by death.

Doctor Hunt was one of the original members of the "Surgical Club," which was organized in 1877 by a few Philadelphia surgeons, among whom in addition were Agnew, the two Grosses, father and son, Levis, Maury, and Reed; no additions were ever made to the original membership. The surgical club was designed as a semi-social scientific association, meeting twice a month at the members' houses, when interesting cases were presented and informally discussed. Following this, there were simple refreshments and social intercourse. Two years later, in 1879, when its members formed the present Philadelphia Academy of Surgery, the "Surgical Club" was made entirely a social organization. The surviving members continue to meet occasionally during the winter season to dine together.

Doctor Hunt was eminently social in his disposition, was always a welcome guest at the Wistar and other parties, and on less formal occasions among his professional friends. But the one entertainment which gave him probably the greatest pleasure was the "Sylvester Eve" gathering, each year at the home of Dr. Albert Fricke. These were charming evenings, quite unique, and ever to be remembered, for the prevalence of wit and humor, and for their extraordinarily bountiful hospitality.

At the close of each year the same chosen few assembled to bid adieu to the old year and to welcome the new. From time to time a vacant place was noticed, and, among those missed during recent years, there was none whose absence was more sincerely regretted than Seidensticker, Leidy, and Hunt. The last time that Doctor Hunt was present was on the eve of the New Year of 1895, and this occasion was the last time that he was an evening absent from his home.

Doctor Hunt was appointed an Acting Assistant Surgeon of the United States Army, May 16, 1862, serving until October 31, 1863, when, as shown by the records of the War office at Washington, his contract terminated. He had been previously detailed by Surgeon-General Henry H. Smith, of the Pennsylvania Volunteer Service, for duty at St. Joseph's Hospital, Philadelphia, April 18, 1862, in caring for the wounded soldiers.

In December, 1862, Doctor Hunt wrote to the Sanitary Commission expressing his willingness to "coöperate in its examination into the condition and wants of the U. S. Military Hospitals," and under date of March 30, 1863, his proposition was accepted and he was directed to make a tour of the service. He was consequently appointed a "Special Inspector of the General Hospitals of the Army," and in that capacity was entitled to all the benefits of the Order of the Secretary of War, dated June 13, 1861, directing and enjoining all persons in the employment of the United States forces to respect and further the inquiries and objects of this Commission to the utmost of their ability. His Commission received the endorsement of the Surgeon-General of the United States Army. Doctor Hunt was instructed to report on April 15th, at New Haven, Connecticut, to inspect the General Hospitals at that place, and thence, successively, and in the order most convenient, to examine the Army Hospitals at Newport and Portsmouth Grove, Rhode Island; Boston, Mass.; and Brattleboro and Burlington, Vermont, for the remainder of the month, concluding with the direction to visit and examine in a general way the Hospitals at Newark, New Jersey. He was on duty, in active service, at Frederick City, Maryland, from September 21st to 26th. On the latter date he was ordered back to Philadelphia to assume the duties of Acting Assistant Surgeon at the U. S. Army Hospital, Fifth and Buttonwood Street. On October 14, 1862, he was relieved from duty at this hospital and assigned to duty at the New Hospital for wounded officers, at Camac's Woods, Philadelphia (now 11th and Norris Streets). It was during this service that Doctor Hunt's con-

tention that it is not the duty of physicians, serving in hospitals on contract, to attend sick and wounded officers out of hospitals, without compensation, was upheld by the Surgeon-General of the United States Army in a communication dated October 7, 1862.

Many of the wounded officers rested in Philadelphia for treatment, *en route* to their respective homes, and it was at the house of Morris L. Hallowell, No. 912 Walnut Street, who for this purpose generously gave up his own private dwelling (called by Oliver Wendell Holmes, the "House Beautiful") that Doctor Hunt and Doctor Thomas G. Morton attended Col. Norwood Penrose Hallowell, Col. Edward Needles Hallowell, Col. Francis W. Palfrey, Captain Oliver Wendell Holmes Jr. (now Judge Holmes of the Supreme Court of Massachusetts) and many others, all officers in the army. In a characteristic, punning letter to Doctor Hunt, Doctor Holmes afterwards acknowledged the services to his son with, "good bye my kind friend and my son's friend, whom I have delicately commemorated in my "Hunt after the Captain." Later, as a further evidence of appreciation, he sent him author's copies of all his works published to that date, May, 1863.

Doctor Hunt for a number of years was one of the editorial staff of the *Annual of the Universal Medical Sciences*, which is published in this city, and was a rare, but highly esteemed contributor to the *American Journal of the Medical Sciences*. In the *Transactions of the College of Physicians of Philadelphia*, are several communications from the pen of Doctor Hunt. Among the special articles of which he was the author may be mentioned:

"A Memoir of George W. Norris, M.D., Vice-President of the College of Physicians," etc., etc., 1876; "Popular Fallacies about Surgery," *Lippincott's Magazine*, December, 1881; "The Rights of a Consultant to Compensation," *Medical News*, December 15, 1888; "Diabetic Gangrene," *Transactions of the Philadelphia County Medical Society*, November 28, 1888.

In reference to the paper on Diabetic Gangrene it may be stated that Doctor John S. Billings in acknowledging, under the date of February 1, 1889, a copy which had been sent to the library of the Surgeon-General's office, Washington, wrote: "I have read the paper with much interest. I know of no other American paper on the subject." Dr. Hunt also edited "Wilson's Dissector's Manual," in 1858, and, in conjunction with Doctor Thomas G. Morton, compiled "Surgery in the Pennsylvania Hospital," 1880.[1]

[1] The titles of all the articles contributed by Dr. Hunt to medical literature, etc., are, as far as can be ascertained, as follows: "On Phosphorus Necrosis," *American Journal of Medical Sciences*, Vol. XLIX., 1865; "On Ossification of the Crystalline Lens," *American Journal of Medical Sciences*, Vol. XLVIII., 1865; "Death from Hemorrhage, Caused by a Sharp Sequestrum Cutting the Popliteal Artery," *American Journal of Medical Sciences*, Vol. L., 1865; "Case of the Co-existence of Tetanus and Paralysis," *American Journal of Medical Sciences*, N. Series, Vol. XLV., 1863; "On Fractures of the Larynx, and Ruptures of the Trachea," *American Journal of Medical Sciences*, Article IX., April,

Some thirty years ago when it was decided to publish the "Pennsylvania Hospital Reports," Dr. Hunt, with Dr. J. M. DaCosta, undertook the labor of editing them, and he contributed personally several clinical papers to the volumes published in 1868 and 1869, when the series was discontinued. He also contributed articles to the "International Encyclopedia of Surgery" and assisted in preparing the American edition of "Holmes' System of Surgery." His interest in general medicine and in science was shown by his membership in the Academy of Natural Sciences of Philadelphia (being one of the incorporators of the Microscopical Section of this organization), and also by his membership in the American Medical Association to which he was elected a delegate from the College of Physicians on five different occasions.

After President Garfield was wounded, both the medical and the lay press joined in controversies as to the proper management of gunshot injuries of the vertebræ and the criticisms of the actual methods adopted by the physicians in charge of the distinguished patient engaged the attention of surgeons all over the world. During this period of painful suspense Doctor Hunt, especially aroused by what he considered the very

---

1866; "Physiological Observations and Experiments on a Case of Large Artificial Anus, with an Account of the Surgical and Mechanical Efforts to Cure," Penn. Hosp. Reports, Vol. I., 1868; "A Contribution to the History of Toxemia," Penn. Hosp. Reports, Vol. I., 1868; "Fatal Chorea; Death Consequent on the Aggravation caused by a Simple Fracture of the Humerus," Penn. Hosp. Reports, Vol. II., 1869; "Extracts from Clinical Lectures," Penn. Hosp. Reports, Vol. II., 1869; "The (Morton) Ward Carriage," Penn. Hosp. Reports, Vol. II., 1869; "Traumatic Rupture of the Urethra," *Phila. Med. Times*, 1871; "Unusual Surgical Cases," *Phila. Med. Times*, 1872; "Clinical Notes and Reflections," *Phila. Med. Times*, 1875; "A Memoir of George W. Norris, M.D.," Transactions College of Physicians, 1876; "On Inequality in Length of the Lower Limbs," etc., *American Journal of Medical Sciences*, Art. X., January, 1879; "Letter on the Case of President Garfield," *Med. News and Abstract*, November, 1881; "Clinical Lecture on Injuries of the Spine," *Med. News and Abstract*, November, 1881; "Popular Fallacies About Surgery," *Lippincott's Magazine*, December, 1881; "Fetal Burns During Advanced Pregnancy, the Burns of Mother Apparently Impressing Themselves on the Child *in Utero*," *Am. Journ. Med. Sciences*, January, 1881; "Esmarch, Antisepsis and Bacillus," *Med. News*, January, 1883; "Discoveries in Regard to Bacilli," *Med. News*, 1884; "The Rights of a Consultant to Compensation," *Med. News*, 1888; "Diabetic Gangrene," *Trans. Phila. Co. Med. Soc.*, November, 1888; "Health Gymnastics at Baden Baden," Phila., 1888; "Vesical, Urethral, and Preputial Calculi," *Keating's Cyclopedia Diseases of Children*, Vol. III., p. 596., Phila., 1890; "In Memoriam: Dr. Joseph Leidy, Personal History," read at the Academy of Natural Sciences, May 12, 1891; "An Address upon the late Joseph Leidy, M.D., LL.D., His University Career," read before the alumni and students of the University of Pennsylvania (Medical Department), November 17, 1891; "Address Before the Graduating Class of Nurses, St. Luke's Hospital, Bethlehem," 1893; "Cystic Growth Within the Internal Condyle of the Femur," *Trans. Amer. Surg. Ass.*, 1893. For "Holmes' System of Surgery," First American, from the second English edition, Philadelphia, 1881, Dr. Hunt revised the following articles: "Erysipelas," by Campbell D. Morgan, F.R.S.; "Pyemia," by George W. Callender, Esq. To the "International Encyclopedia of Surgery," Vol. I., New York, 1886, Dr. Hunt contributed the article on "Traumatic Delirium, and Delirium Tremens." Dr. Hunt, with Dr. Morton, furnished the article on "Orthopedic Surgery," for the series 1888 and 1889, of the *Annual of Universal Medical Sciences*, edited by Dr. Sajous, Philadelphia.

unjust aspersions of a noted German surgeon upon the attendants on the case, wrote several articles in defense of American surgery, which were widely published.

It was in connection with this subject that Dr. Oliver Wendell Holmes wrote to Doctor Hunt, and as the letter is written in the inimitable style of the Philosopher of the Breakfast Table, I will take the liberty of introducing it here, the more willingly, because it contains some autobiographical references which should not be lost.

"Boston, November 18, 1881.

"*Dear Dr. Hunt:*

"I received *Lippincott* (which I intended to have bought, of course), this day, and sat down at once and read your article in it. I was greatly interested in it, as all medical and semi-medical readers must certainly be. I think the average reader of the *Atlantic*, who is more literary than scientific, would consider it rather professional for that magazine.

"I am pleased to say that I have also found, this same day, in a pile of pamphlets which came on me like an avalanche: 'On Injuries of the Spine' and 'Correspondence,' which you were kind enough to send me with your regards. I believe I told you that I had, until within a few days, been very busy with my 'Memoranda' for the 'Memorial History of Boston.' I got off my second revise yesterday, so that I could sit down in peace and read both your articles deliberately, which I did after finishing the one in *Lippincott*. I could not help being interested in these, as you may well suppose. Your theory, or argument, relatting to the part played by the sympathetic in injuries to the bones on which the chain of ganglions lies, seems to me entirely reasonable. It is just what ought to have been thought of, but I think you have the merit of first suggesting it.

"Your letter about President Garfield's case is excellent and will be most acceptable to the profession, I have no doubt. I read every word of it with great pleasure, agreeing with all you said.

"I am an outsider in every point of view, and I have not forgotten the Dutch saying, of which, in fact, I am rather fond: 'The man on the dike bowls well.' But I cannot help remembering some of my own oracular dicta delivered from the domestic tripod, two of which are called to mind by your pages. In the early days of the President's wound I, too, said and repeated until it bored the household, 'whereof he languished and, languishing, did die.' I, too, suggested to my fireside audience that the thoracic duct might have been injured, which would account for the great emaciation. (I remembered the case of Calvin Edson, the Living Skeleton.)

"I also, sitting on the dike, proposed to fitting, not promiscuous hearers, the enemata of defibrinated blood, which a day or two afterward I saw had been administered. So you see what a doctor was lost when I took to writing verses and stories.

"But let me close my letter by thanking you, most sincerely and heartily, for the great pleasure and the abundant instruction which your most valuable papers have afforded me.

"Believe me, dear Dr. Hunt, faithfully yours.

"O. W. Holmes."

In connection with the same subject I have also found, among the correspondence of our late Fellow, several very interesting letters (which, like the preceding, have never been published) from our former President, D.

Hayes Agnew, one of which contains certain comments upon the wound of President Garfield, and upon the pathology of this class of injuries, and especially upon the influence of the psoas magnus muscle in concealing gunshot wounds of the lumbar vertebræ, which really constitutes a practical contribution to the literature of this department of surgery.

Dr. Agnew writes:

"August 23, 1881.

"*My Dear Hunt:*

. . . "The (President's) case is a very plain one and demands no unusual skill to manage, as you well understand. It was a grave injury at the start and continued to be so, and while by no means hopeless, the result, in my judgment, is very doubtful. The popular mind cannot, of course, understand, what is so clear to you and me, that even though a bullet may not enter the serous cavity of the chest or abdomen, yet, in traversing the line of both of these cavities outside of the pleura and peritoneum immense damage may be done. The track of the ball has been traced from the point of entrance behind the eleventh rib, through the loin and forward beyond the anterior border of the iliac fossa; this would make a distance of at least sixteen inches. The simple state of things is this: that, at the time the first operation was performed, when rigors, sweating, and high temperature occurred, the President became septicemic, and all the phenomena since have been due to this. There is no evidence, however, of any metastatic abscess, no chest symptoms, and no kidney trouble, and consequently he may, possibly, weather it yet."

A subsequent letter contains some practical comments upon the letter which Dr. Hunt had published in the *Medical News*.

"October 8, 1881.

"*Dear Dr. Hunt:*

"There are but two points which I think you have omitted, which have any material bearing on the subject.

"First. The influence of the psoas magnus in concealing shot wounds of the lumber vertebræ, at least wounds of entrance.

"Second. The thoroughness of the drainage secured by properly planned incisions.

"You are right in regard to no exploration having been made by the consulting surgeons on being called to Washington two days after the shooting, although Bliss, in his slip-shod article in the *Record*, says such explorations were made. You are right, also, in stating that the nervous symptoms were chiefly in the right limb and altogether on the right side of the scrotum. I may also say that the early disappearence of these symptoms; the absence of any loss of power in the lower extremities; the general direction of all instruments used in explorations of the wound, for washing, being downward; the appearance of a well-defined ecchymosis over the abdominal parietes, a few days after the accident, above the anterior superior spinous process of the ilium, with corresponding tenderness to pressure, and the tingling of the left scrotum favored the opinion that the ball might be in the walls of the abdomen in the above locality, though, as I said to you before, I never pretended to know where the ball was. There was no psoas abscess. The opening in the vertebræ was not discovered until the psoas muscle was laid open.

"Your friend truly,

"D. Hayes Agnew."

With regard to a disputed point in the published account of the case, Dr. Agnew confirmed Dr. Hunt's statement in the following letter:

"December 5, 1882.

"*Dear Dr. Hunt:*

"You are right, no examination was made by the consulting surgeons at the time of their visit. They were informed that careful explorations had been made at the time of the shooting by Bliss and by Wales. Bliss admits that he committed an error on this point, writing, as he did, in New York and without any notes to refer to.

"I have examined all accessible sources and find no case of perforating shot wound of the vertebræ which did not prove fatal, and I think you may challenge Esmarch to produce from the records of surgery a case of recovery in which this injury was positively determined. Remember and draw a distinction between perforating and all other shot injuries of the spine. Indeed, few of any degree recover.

"Your friend truly,

"D. HAYES AGNEW."

If we recall the time when this celebrated case was the general topic for discussion among surgeons, it will be understood that Dr. Hunt was led to enter the lists, both by his patriotic desire to uphold the credit of American Surgery and by loyalty to his friend Agnew, whom he considered to be held up to censure in a clinical lecture in which Professor Esmarch had reviewed and sharply criticised the treatment of the distinguished patient by his medical attendants.

When the closure of the lying-in wards of the Pennsylvania Hospital was under discussion, the assertion was unjustly made in a medical journal that the cause of this action was the great prevalence of puerperal fever, which had been attended by unusual mortality, in this institution. Doctor Hunt wrote to Professor S. D. Gross upon this subject, which well illustrates his ability as a writer, and his skill in presenting the facts and argument in as few words as possible, and keeping directly to the point. With his published communication on "Hospitalism," it forms a really valuable addition to the controversy upon the relation of puerperal fever to infection.

About the same time that this letter was written, Doctor Hunt had published a communication in the *Philadelphia Medical Times*, on the subject of "Hospitalism," defending the institution, with which he had been prominently connected for many years, from the sweeping charges of maladministration made by an essayist belonging to the Public Health Association. (This also appears in "Surgery in the Pennsylvania Hospital," p. 342 *et. seq.*)

Dr. Hunt's contributions to medical literature show that his writings were never prepared in an egotistic spirit, to bring himself or his views into prominence, but were always inspired by a desire either to refute error or to advance the cause of science. Doctor Hunt's sense of humor was very keen, and his fondness for repartee, clever jests, and witticisms, is

shown in his writings as well as in his daily conversation. An illustration of his appreciation of the ridiculous aspect even of serious questions is afforded by the following unsigned communication, which he sent to the editor of the *Medical News:*

"MAGDEBURG, January 10, 1884.

"*To the Editor of the Medical News:*

"SIR: I have thought that some account of the recent discoveries in regard to bacilli might interest readers who are remote from the great radiating centres of constructive science. The latest of these discoveries is even yet spoken of here with caution, but by the time you have printed this it will have revolutionized one branch of physiology and produced an evolution of novel ideas, the final results of which not the boldest can predict. But before outlining for your readers a discovery which I am privileged to communicate by permission of Professor Coccischlächter, and before it has been fully published at home, it may be well to describe the Krankheitenursprungsanstalts Museum of Bacilli, collected by the Herr Ober-Professor Keimerzeuger von Verdammt-Narrburg.

"This has been done at the cost of more than one life upon the altar of science. The museum is a room about thirty feet square, with double walls of glass, between which circulates water, kept at a temperature of 30° C. by three gigantic thermostats, which are so accurate that the heat does not vary the one-fiftieth of a degree. Ranged along the sides, exposed to air or under glasses, are hundreds of half-potatoes on which grow various bacilli; of late, however, boiled cabbage is said by Keimerzeuger to answer better. Certain specific cocci flourish on the *Beta altissima* or mangel wurzel, but as to this choice of cultur-gartens more is to be said. To walk through this museum with the Herr Professor Keimerzeuger is interesting. Before entering, a mask is given you and a bottle of condensed oxygen, so as to enable you not to inhale the atmosphere loaded with germs. In tones muffled by the need to speak within the mouth-piece, you learn that to the left is a tubercular potato, its surface gray with the potencies of countless deaths. Near it the bacillus of rheumatism flourishes on the cut surface of the succulent beet beside the ruddy germs of specific disease. Scarlet fever infests this potato, diphtheria that. The new bacterium of pneumonia flourishes on a boiled watermelon, and glanders, cholera, smallpox, and hydrophobia spread in tiny greenish growths* over the little gardens of gelatine. For a moment, in my interest, I displaced my mask. The Professor instantly seized me and hurried me from the room. 'What a risk!' he said; 'my last assistant did as you did, and died in seven days of acute phthisis with symptoms of hydrophobia and whooping-cough, combined in horrible equality.' I did not desire to reenter this box of Pandora. In adjoining apartments of less size are experimental cultivations, those which are still in doubt. Among the most interesting is the micrococcus of gout, found to flourish best upon gelatinized turtle soup.

"A most striking practical result has grown out of some of Coccischlächter's and Keimerzeuger's later researches. They have been able to show that the bacterium of colic flourishes on the green apple, which accounts for the gripes experienced by youthful gourmands. But far more remarkable is the fact that certain micrococci and bacteria die, as proved by Coccischlächter, in some culture materials, and thrive, as shown by Keimerzeuger, on others. Thus the tubercle bacilli flourish on boiled cabbage (Keimerzeuger), but perish on moist sauer kraut (Coccischlächter), so that by a persistent diet of the latter article they have been able to saturate some of their devoted assistants up to the point of insusceptibility, a discovery which will, we trust, put an end to the cavils at the failure of these researches to yield practical results. . . . ."*

**Medical News*, February 16, 1884.

In October, 1893, Dr. Hunt delivered an address at St. Luke's Hospital, Bethlehem, Pennsylvania, in which he related an incident which happened many years ago at the Pennsylvania Hospital and which he always said was one of the best he had met with among many in his long experience.

"Those of you," says Dr. Hunt, "who are familiar with the story of 'Rab and His Friends,' can fully realize the relations between the surgeon, the poor cancer-stricken patient, and the students. The author most touchingly and truthfully pictures scenes which are familiar in every general hospital. Sometimes these scenes are highly amusing in the midst of the tragedy. The idea of anything amusing in a hospital! I had occasion to amputate the thigh of a negro in the clinic. There was a large audience. I knew nothing of the previous history of the patient. The operation was over. The stump was sewed up, but not yet washed. I had on my apron, which was pretty well stained. The patient was let up out of the ether. Slowly he raised his head and took a deliberate view of the bloody stump, then addressing me in a tragic voice: 'Be thy intents wicked or charitable?' 'Charitable,' I said. 'Thou comest in such a questionable shape,' and as he was being wheeled out of the room he called back: 'Hamlet, King, father, Royal Dane,' amidst the laughter and uproar of the class. He made a good recovery. Here the laughter was allowable; the farce succeeded the tragedy, the unconscious humor of the patient over his own case took away, for a moment, the pity of it. I have known the highest tension of the operator relieved by some pleasantly whispered conceit of a bystander or assistant. So humor has a place even in a hospital. It is not always necessary to be 'dressed in an opinion of wisdom, gravity, profound conceit.'"

Early in October, 1886, Dr. Hunt with Dr. Leidy and a number of Philadelphians, made a visit to Luray Cave and the Natural Bridge of Virginia; the object of the visit was to select and dedicate a column in the cave to Dr. Leidy. A preliminary tour of the cave was made by the party in order to select the column, after which the Natural Bridge was explored. The stalactite selected was very large, and, indeed, was said to be the largest in the world. On reaching the column in the cave Dr. Hunt, as chairman of the committee, made the following address:

"This column and that stalactite in the caverns of Luray are dedicated to Professor Joseph Leidy. May they thus aid to perpetuate the name of one who, holding communion with the visible forms of nature, has so learned to interpret her grand simplicity that to hear him is to understand. From now on those objects will be known as the 'Leidy Column' and the 'Leidy Stalactite.'"

The scene as Dr. Leidy stepped to the front was an impressive one. He was surrounded by loving and admiring friends and the dark shadows and fantastic images from the torch-lighted stalactites, thrown over the party, made a scene not soon to be forgotten. His voice trembled with emotion, but grew stronger as he proceeded to thank the company for the

honor done him in naming one of Nature's wonders after him, following his remarks by saying that "monuments made of stone had never met his approval, but under such a monument he would gladly repose after his work was done."

With the exception of the attack of typhoid fever already mentioned, which occurred at the outset of his medical life, and the illness resulting from the injury received late in life, Dr. Hunt enjoyed exceptionally robust health. One curious fact, however, must not be overlooked; Dr. Hunt was extremely susceptible to certain bad odors and was made promptly ill by them. In his article entitled "A Contribution to the History of Toxemia" he relates that "while remarkably sensitive to the effects of poisonous plants, such as the varieties of *Rhus*, I have never yet had so much as an angry pustule arising from various scratches, punctures, and abrasions received from instruments and bony spicula whilst making dissections or performing operations," yet he was several times made seriously ill by effluvia or noxious emanations from the human body. Dr. Hunt says: "The train of symptoms was so exactly alike in the different attacks that I am sure that there can be no mistake as to the cause, and as I do not remember to have read of similar cases, it may be well to record mine as a contribution to the history of blood-poisoning and as an illustration of the hazards of hospital and professional life." In later years Dr. Hunt was always exceedingly careful to avoid placing himself where he would be exposed to a recurrence of his former serious experience.

On the fourth day of March, 1887, Dr. Hunt met with a grave accident. While crossing the street in the early evening he was knocked down and run over by some passing wagon, and received an injury to the cervical vertebræ (which was then believed to be a fracture), several scalp wounds, and probably intracranial injuries. He was confined to bed for several months and, his health having been greatly impaired, he subsequently went to Europe. At Baden Baden he took a course of gymnastic treatment, by which he was benefited so much that he was able to resume, to some degree, the active duties of his profession upon his return home in the fall of the year. His experience at Baden Baden was the subject of his widely read pamphlet of "Health Gymnastics at Baden Baden," Philadelphia, 1888. He went abroad again in 1889, and greatly enjoyed visiting the London hospitals. On his return home he continued in active practice until 1892, when, his health again being impaired, we spent a month together on a trip to Florida. One year later the effect of the injuries received in 1887, so disabled him that he was compelled finally to retire, and he also resigned the various positions in which he had been a zealous worker up to that time. He gradually declined in health and died at his home, where he had lived for thirty-five years, at the southwest corner of Thirteenth and Spruce streets, Philadelphia, on the 17th of April, 1896, in the seventy-first year of his age. He was buried at Laurel Hill Cemetery.

In early life Dr. Hunt had been rather delicate and spare in figure, although of later years he grew quite stout as he became less active in habits. He was of average height; his face was generally ruddy, and constantly wore a pleasing expression. His features were attractive and regular, although not finely cut. His eyes were blue, and most intelligent, often twinkling with mirth. He was brimful of jokes, and made ready puns. We all remember with pleasure, and were ready to hear "Hunt's Stories," which were very often based on incidents which occurred in his personal experience. He was an attractive and instructive lecturer, a judicious and safe operator, and was considered a consultant of excellent judgment. His thorough knowledge of anatomy, which he loved profoundly, together with his clear perception and extensive clinical experience, coupled with a preëminently-conservative nature, all combined to make him a successful surgeon.

Dr. Hunt was also fond of general literature and, having an excellent memory, he retained what he read. In his writings he had not only a good English style, but also one which was eminently characteristic. He mastered the German language perfectly, and spoke it fluently.

Dr. Hunt was an intense lover of nature, and quite an amateur botanist. During his summer journeyings he studied flowers, and especially wild flowers, and he gave great pleasure to those about him in demonstrating those beauties of plant growth, which, scarcely visible to the unaided eye, could be easily recognized through the small but powerful lens which he always carried in his vest pocket.

Doctor Hunt had a kind and cheering word for all, rich or poor, with whom he came in contact, especially was this so with the patients of the hospital wards, many of whom came to him after their recovery to express their gratitude, often tendering him some trifling object with their thanks. No one ever heard Doctor Hunt speak harshly; on the contrary, his was a kindly way to everyone and it was this natural, pleasant, assuring manner which made him so welcome by the sick-bed and in the wards of the hospitals. He was a wise counsellor, and an honest man in every relation of life; he was esteemed and beloved by all who had the privilege of his friendship, and all who knew him will bear testimony to his retiring, modest, unselfish, and noble character.

Although averse to forms and ceremonials, and not what is commonly known as a churchman, yet Dr. Hunt was a constant believer in the principles and tenets of the Society of Friends, with whom he always affiliated. The following brief, but comprehensive, declaration of faith was recently found among his papers, in his own handwriting:

God, I acknowledge Thee;
As in the driven leaves of the Autumn's morn,
So in the thunder of the battle's storm,
Source of my faith, I acknowledge Thee;
Father, bless Thou me.

SOME SO-CALLED DIAGNOSTIC POINTS OF GASTRIC CARCINOMA.

BY A. L. BENEDICT, A.M., M.D.,

Professor of Physiology and Lecturer on Digestive Diseases, Dental Department, University of Buffalo; Consultant in Digestive Diseases, City Hospital for Women, Buffalo.

THE frequency with which cancer occurs in the practice of some reporters makes me hesitate somewhat in offering observations on a disease which forms but a small percentage of my experience, and in which only a few cases each year afford me the opportunity for continued study. There are, however, some points which deserve attention and on which I feel at liberty to speak. During the last few years much emphasis has been laid on the following diagnostic points: 1, the presence of a tumor; 2, the absence of hydrochloric acid; 3, the delay of absorption as determined by potassium iodide; 4, the cancerous cachexia; 5, the diminution of urea; 6, the presence of lactic acid not introduced with food.

Carcinoma of the stomach is more frequently of the scirrhous type and located at the pylorus, the portion of the organ most subjected to mechanical irritation. Cancer situated elsewhere in the stomach is more cellular and less apt to form a distinct tumor. Cases have been reported in which the tumor at the pylorus has been entirely of fibroid tissue, but such cases have almost universally been diagnosed as cancer; the mistake and the possibility of relief being noted only at the autopsy. Hence, the discovery of a tumor in or near the median line and a little above the umbilicus—or below, if the organ is prolapsed—has long been held to be strong presumptive evidence of cancer of the pylorus. A scybalous mass in the intestine, a tumor of the pancreas, omentum, intestine, gall bladder or biliary ducts, or even gall stones, may have to be considered in the differential diagnosis. It is a safe rule not to make a diagnosis of tumor of any part of the gastro-intestinal tract until after several confirmatory examinations, some of which, at least, have been made after vigorous catharsis. The gall bladder is seldom palpable unless it is much distended with fluid, or rendered hard or crepitant by stones. In the experience of the writer, gall stones are surmised rather than diagnosed, prior to section, ante- or post mortem. Statements to the contrary usually emanate from those who are not aware of the frequency with which biliary calculi that are found at post mortems have occasioned no symptoms during life. Naturally, if one limits his knowledge of gall stones to those causes which are attended with colic and jaundice, the matter of diagnosis is easy enough, but such cases are the exception, not the rule, though they may properly be considered typical. An excellent way in which to distinguish a tumor of the stomach is to map out

the area of the organ by auscultatory percussion or by auscultation of vibrations set up by the tuning fork or some similar device. In this way the limits of the superficial and moderately deep parts of the organ may be determined within a quarter of an inch. If the palpable tumor falls just within the right border of this area, or is adjacent to it, it may be concluded that the tumor is one of the pylorus. The resonance of the tumor, however, will not be the same as that of the rest of the stomach, on account of the diversity of structure. Tumors of the colon are rare but, in case of doubt between such a tumor and one of the pylorus, the injection of water or of air into first one viscus and then the other will probably so alter the relations of the tumor as to enable a diagnosis of its attachment to be made. Cancer of the head of the pancreas and of the biliary passages are, in many instances, indistinguishable, both causing intestinal indigestion with fatty and offensive stools, as well as jaundice and distention of the gall bladder. As a rule, cancer of the pylorus can be distinguished from either of these conditions by changing the level and size of the stomach, as suggested for the differential diagnosis between gastric and colic tumor.

The diagnosis of the variety of tumor is extremely difficult; it has been made from microscopic examination of pieces of cellular growth found in the stomach contents. But such a diagnosis could only be made by one exceptionally expert and would, obviously, be possible only late in the disease after ulceration had occurred. A series of palpations may apparently show the progress of malignant disease. We know of a case in which a number of clinicians noted the gradual enlargement of a pyloric tumor which on section proved to be smaller than had been estimated at the first examination and not at all malignant. The writer recalls a plainly palpable appendix which he referred, for surgical relief, to a well-known surgeon. The appendix was doubled on itself so as to form a slight enlargement, but not nearly as large as had been thought by at least three observers. This shows how deceptive the size of a tumor may be when examined through a thick mass of tissue. The writer has also noted cases in which he himself or others have simply imagined that tumors could be felt, the deception resting on two factors, a preconceived notion and the natural division of the rectus abdominalis into tumor-like bunches.

The myth that absence of hydrochloric acid is connected as a pathognomonic sign with gastric carcinoma still prevails to some degree. The writer has a list—not to mention conclusions drawn from cases not carefully recorded—of at least fifty examinations of the stomach contents in from one to two hours after a test meal, in which there was absolutely no inorganic acidity, as determined, at first, by phloro-glucin-vanillin, and later by resorcin and sugar. Some of these cases have been entirely cured; the rest have been under observation sufficiently long to exclude all idea of malignancy. Judging also from the appearances of more recent cases, and especially

those occurring in persons too young to be liable to cancer, total non-acidity is very frequently found in cases of mild chronic catarrh or of purely functional trouble, according to the view taken as to the organic or non-organic nature of dyspepsia. A pyloric cancer usually adds to the picture of severe dyspepsia that of dilatation of the stomach and, last of all, of a form of ulceration. Cases of gastric cancer have been reported by several observers, which showed free hydrochloric acid, even within a short time of death. In short, a failure of hydrochloric acid secretion must be regarded simply as an indication of depressed function, and this sign is obviously to be expected in gastric cancer after the disease is well established, but there is no reason why certain cases of cancer may not progress without it nor why entirely non-malignant cases may not be marked by its presence.

About three years ago the writer carried on quite a series of tests as to the absorption of potassium iodide. This test is easily applied and quite impressive to patients, but it is, unfortunately, utterly unreliable. A great source of error is the varying solubility of the capsules themselves, some dissolving readily, others apparently requiring a genuine digestion, since the test is not found for an hour or more after ingestion. Even discounting this extrinsic source of error, the writer found that there was not sufficient uniformity in different cases of the same nature, nor in the same case at different times, to render the test reliable. For example, with a readily soluble capsule, a student suffering from a temporary indigestion showed a delay of the test up to half an hour and, in general, the test did not afford characteristic results, though there were some instances in which absorption might be delayed. Besides, the absorption of a drug is quite a different matter from the absorption of digested nutriment as determined by examination of the gastric contents.

The cancerous cachexia is, in general, a sign of malignant disease. But, considered as a special diagnostic point, it is an open question if it is sufficiently characteristic. The writer would personally disclaim the ability to distinguish between the cancerous cachexia and the similar emaciated, sallow, and anxious countenance of advanced ovarian disease or of complications of hepatic sclerosis with kidney degeneration and, perhaps, severe cardiac lesion. If there is a describable or even appreciable difference between these cachexiæ, it ought to be more distinctly taught.

The present generation of medical men demand clear-cut distinctions and their demand has met with utterly unwarranted generalizations, among which may be included the statement that a diminution of the elimination of urea is a sign of cancer of an internal organ. Very naturally, a person whose body contains a rapidly growing mass of proteid tissue, whose system is poisoned by vicious metabolism, whose appetite and assimilation are reduced below the normal, will eliminate less urea than a person in health, but we cannot reverse such a statement without including a

great many non-malignant cases. There has been a tendency among many men of considerable reputation as clinicians to regard every case as serious in which the 24-hour elimination of urea is found to be reduced to, say, 18 or 20 grammes. Physiologists, taking as a standard a robust soldier or laborer, a man eating heartily and exercising accordingly, correctly state that the daily elimination of urea is from 30 to 35 grammes. Bouchard estimates the normal output at about 26 grammes *per diem* for a man of 70 kilogrammes (154 pounds). This is an abundance for average professional and business men, or for women not required to perform manual labor. A man or woman confined to bed or to the house with some trifling indisposition and with impaired appetite may, normally, have an elimination of only 15 or 20 grammes. Some clinicians do not even take into consideration the weight of their patient or discount the fat that he or she carries, for it is evident that a fat man of 150 pounds will eliminate much less urea than a lean man of the same weight.

The following illustrative case may be cited from actual experience. An overworked, anemic woman of 40 gives a history of indigestion and loss of appetite extending over a period of 2 or 3 years. Her face is pinched, complexion pale, and the skin of the body sallow. The writer could not distinguish the appearance from a malignant cachexia. The tongue is coated, the bowels constipated. The stomach contents, one hour after a test meal, are lacking in hydrochloric acid and lactates are abundant. The urine, without presenting either microscopic or chemical indications of kidney disease, contains only 12 grammes of urea. The pelvic organs are normal except for the laceration of the cervix so usual in a multipara. Many men would argue as follows: "Here is a woman of the right age for cancer, with an excretion of urea only one-third of the normal and not explained by renal insufficiency. This in itself is an indication of cancer and the anemia and cachexia are corroborative. She does not show malignant disease in either the pelvic organs or the breasts, rendering similar trouble in the stomach still more probable. The history of prolonged gastric trouble and the entire absence of hydrochloric acid point in the same direction. I cannot feel a very distinct tumor, but in the region of the pylorus there is a certain resistance to my finger." The resistance to the finger in the region of the pylorus is on a par with the insistence in diagnostic tables upon the disappearance of a rash on pressure. Such resistance is always felt except in phenomenally relaxed abdomens, and the disappearance of a rash on pressure is common to all eruptive diseases which are at all apt to be considered in a differential diagnosis of the exanthemata. As a matter of fact, the patient referred to had been treated for fibroid phthisis, which had become almost entirely quiescent at the time the writer was consulted regarding the gastric symptoms. She weighed about 40 kilogrammes, corresponding to an elimination of 15 grammes of urea under ordinary diet and with reasonable activity. Considering her

lack of appetite and recent enforced idleness, the reduction to 12 grammes was to be expected. The anemia was readily relieved by iron and arsenic. The dyspepsia was almost completely cured in a few months, so nearly so that the patient could no longer be induced to visit Buffalo for treatment.

As to the lactic acid test for cancer the writer, more than a year ago, pointed out the *a-priori* improbability of using this test as pathognomonic. Since then he has shown that it is necessary to demonstrate the absence of lactic acid in foods prepared according to Boas' plan, since various gruels made with the utmost care are still contaminated with lactates. Several cases have been reported by various observers showing that this test is not infallible, and the writer is inclined to regard it as merely a round-about method of examining for the absence of hydrochloric acid, since it cannot for a moment be claimed that all the micro-organisms capable of forming lactic acid are intimately connected with cancer, while it is obvious that lactic acid must develop in a stomach lacking the natural antiseptic, hydrochloric acid.

As to the many forms of treatment recommended for gastric cancer, surgery alone offers a hope of radical relief. But statistics of operations are not very encouraging, and it is still almost impossible to make a positive diagnosis of cancer of the stomach, especially of cancer of the wall of the organ not located at the openings, until the case is too far advanced for operation. Gastrostomy is to be thought of only when the cancer is at the cardiac opening. Gastro-enterostomy and other surgical procedures short of radical resection of the deceased part will not appeal favorably to the average patient, most of them wisely preferring to live as long as possible without operation unless the latter offers a reasonable hope of cure. A dilatation accompanying cancer can usually be alleviated by the use of the stomach tube for purposes of cleansing and medicating, and the writer has, in two or three cases, actually cured the dilatation by rest of the stomach during a course of local treatment and of rectal feeding. Still, from the patient's standpoint, there is a grim irony attending the use of the word *cure* when the underlying condition is necessarily fatal. Late in the disease the cancer becomes often a species of ulcer and there exists a contra-indication, though not necessarily an absolute one, to the use of the tube or of the many other local methods of treatment. The palliation of the disease involves attention to a large number of details, some of them but remotely connected with the subject under discussion.

REVIEW OF MEDICINE.

MEDICINE.

The Bubonic Plague. (*Ann. de l'Inst. Pasteur*, January 25, 1897.) By Dr. Yersin.

The author recalls the fact that in all epidemics of the plague, rats seem to be first affected, then the larger domestic animals, and finally the human beings. This suggested to him the fact that, perhaps, the micro-organisms existed in the soil; indeed, he was able to find in the earth of infected localities, a bacillus exactly similar to that of the plague, but not as virulent as that taken from the buboes. This is a small bacillus, with rounded ends, staining deeply at the extremities and decolorizing by Gram's method. It grows readily upon agar and in alkaline bouillon, forming long chains. It retains its virulence and vitality for a long time in the earth, and possibly increases in virulence under certain favorable conditions. Having observed the plague at Hong Kong in 1894, Yersin returned to Paris and, in connection with Roux and Calmette, undertook the production of immunity in animals. The immunizing serum was obtained by injecting a horse subcutaneously with minute portions of a virulent culture. Each injection was followed by a very powerful reaction, the fever sometimes reaching 41.5° C.; the horse became feeble, trembled, refused to eat, and rapidly became emaciated; but finally, when completely immunized, recovered its normal health. With the serum obtained from the horse, it was possible to prevent infection in mice inoculated with a virulent culture. 0.1 c. cm. sufficed to produce immunity if injected 12 hours before the inoculation. Its preventive action was therefore certain. If, however, the mouse had already been inoculated with the plague, from 1 to 1.5 c. cm. of serum were required to obtain a certain cure. When Yersin returned to Indo-China, in 1895, he immediately organized a Pasteur institute and set about immunizing a considerable number of horses. This required some time; but, finally, he obtained a supply of serum properly prepared which was further increased by an invoice from Paris, obtained from the horse that he had there immunized. He immediately departed for the scene of the epidemic and, at Canton, finally obtained permission to try the serum upon a young Chinaman 18 years of age, a scholar in the Catholic Seminary, whose case was considered hopeless in any event. Three injections of 10 c. cm. each were made at 5, 6, and 9 o'clock in the afternoon, and the next morning the patient seemed to be almost well. The temperature had fallen, lassitude and other serious symptoms had disappeared, and the swollen glands in the groin were no longer painful. In a few days the patient had entirely recovered. Two other cases were

treated in Canton after Yersin's departure, with equally good results. At Amoy he was more successful in securing patients, as in the Charity Hospital he was able to make an extensive trial of the remedy, and so great was his success, that the Chinese themselves called him to their houses, in order to obtain his treatment, and he was obliged, finally, to fly the city when his stock of serum was exhausted, in order to escape their importunities. Altogether 23 cases were treated; of these 6 were injected on the first day of the disease; cure occurred within 12 to 24 hours without suppuration of the buboes, after injections of from 20 to 30 c. cm. of serum. 6 were injected on the second day of the disease; the cure was complete in 3 or 4 days without suppuration, but it was necessary to inject 30 to 50 c. cm. of serum. 4 were injected on the 3d day of the disease; fever usually persisted for a day or two, and in 2 cases there was suppuration of the buboes. All were cured with from 40 to 60 c. cm. of serum. 3 were injected on the 4th day; suppuration occurred in one case; cure was complete within 6 days; 20 to 50 c. cm. of serum were employed. 4 were injected on the 5th day; 2 died and they were apparently moribund when the injection was made; the other 2 recovered; 60 to 90 c. cm. of serum were used. Altogether, of 26 cases treated, 2 died, a mortality of 7.6%; the average mortality of the plague is rarely less than 80%, and even much higher. Although the number of cases is too small to enable the author to make a positive assertion, nevertheless he feels sure that the rapid convalescence of the patients, so unlike the normal convalescence from the plague, indicates that, in some way, the serum exercises a specific action. The serum that he had at his disposal, had come either from Paris or from Nha Trang, and had been kept a considerable time. None of the horses from which it had been taken had probably reached the maximum degree of immunity. The only disagreeable result of the injection was a certain amount of pain at its site. In a few cases a bacteriological diagnosis was made, but generally the disease was recognized by its very characteristic clinical symptoms. As a conclusion, in view of its high protectiveness in the lower animals, Yersin believes that the serum should be used in the course of an epidemic to protect those not yet affected by the disease.

SAILER.

Examination of Tissue of an Embryo for Widal's Reaction. (*C. R. de la Soc. de Biol.*, January 1, 1897.) By Charrier and Apert.

The authors report the examination of the tissues of an embryo from a mother in the third week of typhoid fever. They found that there was total absence of agglutinating action in the fetal organism, and that in the placenta this property was present. They conclude that the placenta acts as a sort of a filter and retains in the maternal organism, not only the agglutinating substance, but probably also the toxins, whose discharge into the fetal organisms would doubtless cause the development of the agglutinating property.

SAILER.

The Diagnosis of Typhoid Fever from the Examination of the Blood. (*Centralblatt für innere Medicin*, December 5, 1896.) By Dr. R. Stern, of Breslau.

The absence of leucocytosis is a sign of doubtful value, because it occurs also in uncomplicated cases of tuberculosis. The presence of typhoid bacilli in the blood is pathognomonic, but their absence is not conclusive. Stern considers that positive results obtained by the serum methods of Widal and others are a reliable aid to diagnosis, provided certain precautions are taken. In order to make the procedure shorter and easier of application, he modifies Widal's method as follows: The blood is drawn from the sterilized finger-tip and mixed directly with bouillon containing typhoid bacilli from a 16- to 20-hour agar culture. The proportion should be 1 part of blood to at least 10 parts of the bouillon. The red cells are separated by centrifugation and the serum is examined immediately in a hanging drop. Coagulation of the serum seldom occurs before the investigation is completed. The bacilli cease to move and become agglutinated in a quarter to half an hour after centrifugation, without incubation. To obtain the blood and bouillon in proper proportion, Stern uses the pipette from a hemocytometer. He insists upon the necessity of a control experiment with a mixture of the typhoid bouillon and serum from a normal individual, in the same proportion as in the investigation. The importance of this is shown by the fact that he has obtained, in a few instances, the reaction within an hour, with normal serum and bouillon in the proportion of 1 to 10, and in one case with serum from a man suffering from a slight otitis media and with no typhoid symptoms, in the proportion of 1 to 20. He reports observations upon 16 cases of typhoid fever, all of which gave undoubted reaction at the end of the second week of the disease, except one case, in which it did not appear until the 16th day. The earliest day in Stern's series was the 9th. Widal has obtained the reaction upon the 6th. This method is not available for the quantitative determination of "paralysine" (as he prefers to call the active principle), that is, the limit of dilution with which the reaction is obtainable. For this he employs Widal's original method of allowing the blood to coagulate and places the mixture of serum and bouillon culture in an incubator for 24 hours. The limit of dilution in 7 cases ranged from 1 to 100 to 1 to 2,000. Widal seldom obtained it beyond a dilution of 1 to 60 or 1 to 80. Stern suggests that the cause of such discrepancy lies in the difference in susceptibility of different cultures of the bacillus to the action of normal serum, as has been demonstrated by Pfeiffer and Koch in connection with the cholera vibrio. The absence of the reaction is not a proof of the absence of typhoid fever until many attempts have been made to obtain it.

STEELE.

The Blood in Diabetes Mellitus. (*Edinburgh Medical Journal*, September, 1896.) By Alexander James, M.D., of Edinburgh.

The richness in corpuscles and hemoglobin seen in the blood in diabetes mellitus, is considered by Leichtenstern and others to be apparent rather than real; that is to say, that it is due to the poverty of the blood in water, and its consequent concentration as the result of the polyuria. The author has studied 13 cases, in which 5 showed the corpuscles to number over 6,000,000; 5, over 5,000,000; 2, over 4,000,000; and 1, over 3,000,000. The hemoglobin was over 100 % in 3; 60 % in 8; and 50 % in 2. By the method of Roy, no distinct increase in the specific gravity of the blood could be demonstrated in 10 of the cases examined. James is of the opinion that in diabetes mellitus the tendency of the blood to increase in corpuscles and hemoglobin is independent of the proportion of water, and asserts that this increase represents a *vis medicatrix naturæ;* that is to say, an effort on the part of the organism to make up for the great loss of oxidizable material by an increase in the oxidizing power of the blood. In support of this view he adduces the effects of starvation on the blood and circulatory organs. In men entirely deprived of food, it has been shown that the amount of corpuscles and hemoglobin remains high for long periods, the weight of the individual diminishing rapidly. Further, an animal starved to death does not die until it has lost about $\frac{4}{10}$ of its weight, and the proportionate loss in the different tissues and organs is as follows: Fat, 97 %; liver, 53 %; muscles, 30.5 %; skin, 20 %; intestine, 18 %; bones, 13 %; nervous system, 3.2 %; heart, 2.6 %. The meaning of this is plain enough; a starved animal lives on, as it were, by feeding upon itself, and the tissues which can be dispensed with more easily are made use of to feed those which are of more value. The circulatory system is manifestly of the greatest value, for by it only can the transference of food be effected, hence the little loss of weight which it shows in starvation. But in diabetes mellitus there is another phenomenon which is said to favor this theory, and that is the digestive power. All who are in the habit of seeing diabetic patients at their food can but conclude that, whatever else their ailments may be, indigestion is not one of them. The amount of meat and green vegetables which they consume at meals is evidence of this, and is to be interpreted as indicating that Nature is trying to compensate for the loss of oxidizable material through defective secondary digesting or assimilating power, by increasing the primary digesting power. Further, patients are often met with who in the pre-diabetic stage suffered frequently from dyspepsia, and who when diabetes had supervened no longer knew what indigestion was. The writer holds that in this again we have an example of the *vis medicatrix naturæ*, and believes that when a diabetic is beginning fairly to lose ground the richness of the blood, in corpuscles or hemoglobin, will be found to be lessening.

CATTELL.

A Case of Acute Yellow Atrophy of the Liver in a Boy of Four Years. (*Wien. klin. Woch.*, July 23, 1897.) By Friedrich Lanz.

The patient had been reared under exceedingly unfavorable circumstances, and for some months before his admission had shown loss of appetite, dulness, and great thirst. Upon the first day of icterus, he was brought to the hospital where a diagnosis of catarrhal jaundice was made. The next morning he was so much worse that he was admitted to the hospital. Upon examination, the area of hepatic dulness was found to be considerably reduced; there was moderate fever, irregular pulse, some disturbance of consciousness, and constant vomiting. The next day there was coma, and, in the afternoon, tetanic convulsions on the slightest touch. At four o'clock he died with slight convulsions. At the autopsy there was cheesy degeneration of the lymph glands at the root of the lung; enlarged spleen, and a small, firm, tough liver, filled with yellow areas and some small red points. Microscopically, the cells showed indefinite contours, poorly staining nuclei, and fatty degeneration. The central veins were greatly dilated and surrounded by a round celled infiltration. The etiology of the case could not be determined.

SAILER.

The Period of Incubation of Malarial Fever After Treatment with Blood Serum of Immune Animals. (*Centralbl. f. Bakt., Parasit. u. Inf'kr.*, January 20, 1897.) By A. Celli and F. S. Santori.

Knowing that the blood serum of animals naturally immune has no influence upon the course of malaria, the authors determined to make use of the serum of animals that had been repeatedly exposed to malarial infection, in the hope that it would be of more protective value. For this purpose they used blood serum obtained from buffaloes, cattle, and horses, that had been kept in the Paludi Ponti and Maccarese, the most malarial districts in the neighborhood of Rome. In order to decide the question, two methods were employed; in one of which the persons that had been treated with the serum were subsequently inoculated with malarial blood; and in the other certain persons were treated, who, in the period of the year when malaria was most common, were obliged to live in malarial localities. For the first series 6 individuals were treated, receiving 10 c. cm. subcutaneously at periods decreasing from 10 to 4 days. The results were good. Occasionally, there was a very slight local reaction, but never albuminuria. Altogether about 130 grammes of serum were given to each patient. Three of those were then inoculated with blood from a quartan patient; all three passed the longest incubation period that has hitherto been observed without symptoms. In the other three the blood of a severe case of estivo-autumnal fever was then injected, and at the same time into a non-protected control individual. In the first group, fever finally appeared 25 days after the inoculation. The first attack was very light,

only becoming more typical at the second paroxysm. In the second group, fever appeared in the control individual in 43 hours; in the man treated with buffalo serum in 30 hours; in the one treated with horse serum in 6 days; and in the one treated with cattle serum after 17 days. The authors conclude, therefore, that preventive treatment with the serum of naturally immune animals which have been exposed to malarial infection, prolongs the incubation period of experimental malarial fever in human beings. In the second group of experiments, a family that was employed in the Agro Romano was treated as the other patients had been, and but one of five showed any malarial symptoms, and they were quite slight. All the members of another family living in the neighborhood were attacked with severe forms of malaria.

SAILER.

Remarks on Arthritic Gout. (*British Medical Journal*, February 27, 1897.) By Sir Willoughby Wade, M.D., F.R.C.P., of Birmingham.

From a clinical point of view we may usefully divide the cases in which gout appears in connection with the joints into three classes: First, the acute attack of regular gout. Second, chronic gout—possibly a sequel of an acute attack with much deposit of urates in a solid or semi-liquid state. In this, with more deformity, there is much less pain and tenderness; though along with these redness and superficial swelling, may from time to time be superadded with an increase of deposit within the joint. Third, pains referred to the joints, of a more or less fugitive character, or tenderness felt chiefly on use, which latter may, if excessive, be followed by increase of pain and even some redness and swelling, or an attack of the first variety. In an attack of gout which has effected the metatarso-phalangeal articulation of the great toe, lines of tenderness can be detected running from the joint across the dorsal and plantar aspects of the foot in the line of the nerves supplying the joint. This nerve affection sometimes has the character of a neuritis and at other times that of a neuralgia and may, therefore, be described as a neurosis. The lesion may arise from injury or from the presence of some toxic agent in the blood. A neurosis is the primary and essential element. If a sensory nerve is attacked, we get pain and tenderness; if a vasomotor nerve we get redness and swelling; if the nutritive nerve of a joint we get changes in the joint, one result of which may be a deposit of urates. It may be asked how one toxin (uric acid) affects now an external, now an internal sensory nerve; now a motor, now a vasomotor; now a trophic nerve and again an excretory one. This condition causes us to hesitate before we declare positively that gout is dependent upon uric acid as a cause.

JOHN M. SWAN.

Digestive Disturbances Caused by Various Forms of Hernia, especially Hernia through the Linea Alba. (*Mittheilungen aus dem Grundgebiet der Medizin u. Chirurgie*, Vol. I., No. 5.) By Dr. Kuttner.

Like Lindner, he emphasizes the importance of herniæ in causing digestive disturbances ranging from simple flatulence and anorexia to the most severe forms of colic, and he especially calls attention to the exclusion of the rarer forms of hernia in diagnosing such cases. Among these forms he lays stress upon herniæ of the linea alba, which include the not rare extrusions through the fascia of pedunculated fatty tumors from the subperitoneal tissues. These occur most frequently in laboring men in the epigastric region, and are very liable to be overlooked and give rise to diagnosis of gastric ulcer, etc. The most important cause is trauma, and the typical symptoms are tenderness over the hernia, pain in severe attacks, usually caused by strong exertion, large or indigestible meals, and often vomiting. The general symptoms may be slight or go on to syncopal stupor. Vomiting may become so incessant as to endanger life. Not infrequently the symptoms are only those of mild gastritis or neurasthenia. Diagnosis is made by discovery of the tumor, which often gives the feeling of spurting when compressed, and by the absence of any signs of other causes, such as gall stones, gastric ulcer, and nephritic colic. When a tumor is absent, the especial difficulty in diagnosis is gastric ulcer, which may be excluded by the distinctly paroxysmal attacks of pain occurring at long intervals with no intervening dyspeptic symptoms, the lack of hematemesis and of evidence of disturbance of the gastric secretions. The only treatment is radical operation when one will find the sac sometimes containing a knuckle of bowel—oftener a portion of omentum—and sometimes empty. Kuttner recites cases of his own which, though exhibiting severe symptoms, were entirely relieved by operation. EDSALL.

Researches on Gastric Carcinoma. (*Archiv f. Verdauungskrankheiten*, Vol. II, Nos. 1 and 2.) By Dr. Hammerschlag.

The Ewald test-meal was used, with expression after one hour, the lactic acid being tested for by Uffleman's reaction. HCl was estimated by Torpfer's method and proteid digestion by that of the author, and the evidence of motor weakness—quantity and quality of contents—carefully noted. Motor power was weak and its rapid decrease was very striking. The HCl question is no further discussed than to show, from his results, no diagnostic value in the estimation of the HCl deficit. Free HCl was absent 37 times in the 42 cases. The value of quantitative estimation of albumen digestion is emphasized. It was oftentimes lacking and in over two-thirds of the cases below 15%. This is not characteristic of carcinoma, but may occur in atrophy and protracted gastritis. It is, however, of bad prognostic import. The cause of lactic acid production as usually given is lessened HCl production with coincident motor insufficiency. To this he assents with the

addition of a further cause—a deficit in ferments. Lactic acid was present in 26 cases. Sometimes it was present, however, only in the later stages, and he further cites 6 of his own cases, not carcinomatous, in which it was present. In general, motor insufficiency occurred early, as did lessened HCl production; then the ferments were decreased, and subsequently lactic acid appeared. As to diagnosis, he states that if, after repeated examinations for 3 to 4 weeks, free HCl fails to be found, the albumen digestion is below 15%, lactic acid and the long bacilli described by Kauffman and Schlesinger are present in large amounts, and, further, no improvement occurs, one is justified in diagnosing carcinoma without tumor or cachexia. Rapidly increasing motor weakness is of diagnostic value. From the histological examination of fragments of mucous membrane in which he found replacement of the glandular cells by cylindrical epithelium and the presence of many eosinophile cells, he concludes that the lack of HCl and ferments is due to this widespread atrophy, which is not always accompanied by interstitial overgrowth.

EDSALL.

The Diagnosis of Gastric Carcinoma from Wash-Water and Vomit. (*Deutsch. Archiv. f. klin. Med.*, Vol. LVIII, No. 1.) By Dr. Reineboth.

Reineboth was led to the examination of small clots washed out in lavage or found in the vomit in suspected cases by observing that the hemorrhage often takes place from superficial tissues and may carry portions of the mucous membrane or tissues with it, and that these clots are readily found by the patient himself. In 10 doubtful cases he found clots in but one, while of 8 already diagnosed cancer clots were found in 4. In one of the latter no tissue was present in the clots. The sections in the one doubtful case were likewise of doubtful nature, while of the other 3, sections from one were also of uncertain nature, and 2 showed undoubted cancer. These results were not encouraging, and he believes that most carcinomata that are even superficially ulcerated and thus give rise to hemorrhage, may be depended upon to have already advanced beyond radical operation, so that this examination can not aid much in treatment. [It might, however, clear up a doubtful diagnosis.]

EDSALL.

The Behavior of Pepsin in Diseases of the Stomach. (*Archiv f. Verdauungskrankheiten*, Vol. II., 1.) By Dr. Oppler.

The author admits the value of Hammerschlag's quantitative pepsin estimation for clinical purposes, but against its use in exact work raises the objections that Esbach's albuminimeter is very inaccurate, that it does not take into account the albumen in the stomach contents, that the period of digestion is too short, and that so small a portion of the stomach contents may not be representative of the whole. To overcome these difficulties in

his work he washed out the stomach repeatedly with small quantities of water after expressing the contents, and to the whole thus collected added water to two litres, filtered, added HCl to an acidity of 77. To 50 c. cm. of this were added 20 c. cm. 2% albumen solution, and this digested 3 hours, the albumen and syntonin removed, and the nitrogen in the resulting liquid estimated by Kjeldahl's method. In the same way he determined the nitrogen in the diluted stomach contents, and deducted this from the former result. The remaining nitrogen indicated the amount of digestion by comparing with the nitrogen present in the original albumen solution determined by the same method. By this method, as against Hammerschlag, he finds that the pepsin-digestion never entirely failed in 26 cases examined, and that its extent was directly in proportion to the amount of HCl and the activity of the milk curdling ferment. Particularly does he oppose Hammerschlag's view in carcinoma, finding here no regular early lack of pepsin, but a decrease largely proportioned to the decrease in HCl; in other words, depending upon the general decrease in gastric secretion. Like conditions were found in other diseases, and he concludes that any variation in pepsin secretion is not pathognomonic of any condition, but only of value in connection with study of the other components of the gastric juice.

EDSALL.

Two Cases of Idiopathic Arterial Hypermyotrophy. (*British Medical Journal*, January 23, 1897.) By Thomas D. Savill, M.D. M.R.C.P., Lond.

This affection may go on for many years without any evidence of its existence, so long as the cardiac hypertrophy compensates for the increased peripheral resistance. The thickening of the vessels may be accidentally discovered when the patient consults his physician for some other complaint; then the characteristic thickening of the walls of the arteries can be made out in the superficial vessels. It is readily distinguished from atheroma by the absence of the bead-like inequalities which the latter produces. Atheroma, moreover, attacks primarily the large vessels and must be in an advanced condition to affect vessels of the size of the radial. Symptoms: 1. The characteristic feature of the pulse in arterial hypermyotrophy is its perpetual state of high tension, which lasts almost until the conclusion of the history. This is due to a combination of increased peripheral resistance with the secondary cardiac hypertrophy. 2. Vertigo, lasting only for a few moments, coming on without warning, usually after assuming an erect posture, and sometimes accompanied by a feeling of faintness, is a constant symptom of the disease. This vertigo differs from that which is met with in Menière's disease by the absence of the aural and other symptoms of that condition, and by the presence of cardio-vascular signs, namely, thickening of the arteries and hypertrophy of the heart. This vertigo is to be distinguished from that of cerebral tumor by the

absence of other symptoms of the latter condition. The vertigo of *petit mal* very rarely occurs for the first time at the period of life when arterial hypermyotrophy ordinarily supervenes, and it is generally, sooner or later, attended by attacks of a more severe character. Hysterical vertigo, which resembles the sensation very closely in many respects, usually occurs for the first time at a different age and, moreover, is usually confined to the female sex. 3. Paroxysmal dyspnea and headache are sometimes seen. 4. The urine presents nothing pathognomonic, but it should always be carefully investigated in order to exclude contracted granular kidney (chronic interstitial nephritis). It will usually be found to be slightly increased in quantity and of low specific gravity. 5. Hemorrhage, gangrene of the extremities, and angina pectoris may complicate the arterial disease. The chief indication for treatment is to reduce the high arterial tension. This may be accomplished by saline purgatives, calomel, or even by blood letting. Rest is useful, either alone or combined with massage and passive movements. In the earlier stages of the affection, Schott baths and exercises may be used. For the giddiness and dyspnea, nitro-glycerin seems to be the sovereign remedy. Two cases are reported in full.

JOHN M. SWAN.

Remarks on the Dorsal Test for Pericardial Effusion. (*British Medical Journal*, January 23, 1897.) By William Ewart, M.D., Cantab., F.R.C.P.

In a previous paper, on "Practical Aids to the Diagnosis of Pericardial Effusion in connection with the question as to Surgical Treatment," which appeared in the *British Medical Journal*, March 21, 1896,[1] the author described the appearance of a patch of dulness of definite size and shape, at the posterior portion of the base of the thorax in cases of pericardial effusion. This dull patch is more than a sign; it is also a test, since its presence proves, with certain exceptions; and its absence negatives, the existence of pericardial effusion. Careful observations by percussion, demarcation during life, and by surface markings and subsequent dissection after death have conclusively demonstrated that this dorsal patch of dulness is a modification of the liver dulness. This patch is located between the tenth and twelfth ribs and close to the spine. The dull patch is caused: first, by a slight upward displacement of the compressed base of the lung; second, by a slight downward displacement of the anterior portion of the left lobe of the liver, due to the weight of the pericardial fluid, without any marked depression of its posterior portion; third, by a corresponding depression of the stomach, with or without slight displacement to the left. This patch of dulness is normally present in small children, up to the age of about four years, independently of any effusion. It was also found to be present in two adults who were emaciated on account of pulmonary tuberculosis

[1] See INTERNATIONAL MEDICAL MAGAZINE, June, 1896, page 347.

and typhoid fever respectively. In cardiac enlargment the dulness in question might be expected and in young subjects this is a source of fallacy to be carefully borne in mind. With these reservations, children, emaciated adults, and cardiac hypertrophy, the practical value of the sign remains unimpaired. JOHN M. SWAN.

Concerning the Treatment of Chronic Empyemata by Decortication of the Lung. Results; Indications; Technique. (*Gazette des Hôpitaux*, December 24 and 29, 1896.) By E. Delorme, M.D.

The indications for the treatment of chronic empyema by decortication of the lung are: A membrane which is separable and a lung which is permeable; although it must be borne in mind that if the membrane can be removed, the lung, which was originally not permeable, will finally expand itself. The duration of the disease, its etiology, its nature, the results of bacteriologic examination, or auscultatory signs, do not furnish enough evidence to establish these points, and in order to definitely settle the question the operator should attack the membrane and the lung directly. In such case after the membrane is incised it either will or will not separate itself. In the latter instance the operation is stopped. If the membrane will strip readily the operation should be continued even if the atelectatic lung does not expand at once; for if freed from its encapsulating membrane it may become either wholly or partially dilated. If a permeable lung is riddled with superficial tuberculous cavities the operation should be abandoned on account of its dangers. The technique of the operation should be as follows: Several days before the operation the cavity should be cleansed freely by non-toxic antiseptic solutions. The seat of the opening in the thorax ought to be determined by the size of the cavity and by the adhesions between the lung and the chest wall. The relations of the lung with the chest wall may be determined by the sound or by the finger; by such an examination a wound of the lung may be avoided. The operation should be as short as possible and hemorrhage should be avoided in order to prevent shock. The pyogenic membrane and the granulations adhering to the thoracic wall and to the neighboring structures should be quickly scraped away, and then the capsule should be incised slowly, accurately, and progressively. When the first incision is made, if the lung shows a very marked tendency to form a hernia it is better to make a second incision on another lobe, so as not to be bothered by the movements which would otherwise be produced by the expanding lung and by the consequent masking of the field of operation. If a pulmonary fistula should occur the operator should endeavor to close it. Such fistulæ are easily recognized by the bubbles of air which appear in the fluids which are in contact with the wound. After the wound is healed a course of respiratory gymnastics should be prescribed. Eighteen cases are reported; ten of these were successful and eight unsuccessful.

JOHN M. SWAN.

Remarks on Wandering Spleens. (*British Medical Journal*, January 16, 1897.) By J. Bland Sutton, F.R.C.S., of London.

A wandering spleen may occupy its normal position for a number of days; then it may suddenly slip out and become apparent in the umbilical or iliac regions; then it may descend into the pelvis. A spleen so displaced may become engorged, it may undergo axial rotation, or it may become atrophied. The latter condition supervenes when axial rotation is so complete that the splenic artery and vein become permanently occluded. The pancreas, from its close anatomical relation with the spleen, may become incorporated in the pedicle. The dragging of a wandering spleen upon the stomach may lead to dilatation of that organ, and tension upon the duodenum may interfere with the common bile duct and produce frequent attacks of severe jaundice. Adhesions may form between a wandering spleen and the small intestine, the colon, the sigmoid flexure, or the vermiform appendix. Aside from their liability to produce intestinal obstructions these adhesions result in injury to the bowel wall, thus creating an avenue for the infection of the peritoneum by septic products. By its pressure upon the uterus, a wandering spleen may result in menstrual disorders, in retroflection, or even in prolapse of that organ. The dangers from wandering spleen are: rupture of the stomach or of the duodenum, intestinal obstruction, abscess of the spleen, and rupture of the spleen. Wandering spleen is to be differentiated from ovarian cyst, renal tumor, movable kidney, malignant tumor of the omentum, and myoma of the uterus. Splenectomy for this condition is a justifiable and highly successful procedure. Splenopexy is not as successful and seems to be an operation attended by greater risks than is splenectomy.

JOHN M. SWAN.

Abolition of the Reflex of the Tendo-Achilles in Sciatica. (*Gazette des Hôpitaux*, December 31, 1896.) By J. Babinski.

The author presented two cases of sciatica to the *Société Médicale des Hôpitaux* in which the tendo-Achilles reflex was wanting on the affected side. The diagnosis was undoubted in each case, and the difference between the two sides was very marked. The author considers the presence of this sign to indicate an organic alteration of the nerve. It ought to prove a valuable means of determining between true and hysterical sciatica; the latter not being a true neuralgia.

JOHN M. SWAN.

Contribution to the Pathology and Therapy of Aortic Aneurisms. (*Deutsche medicinsche Wochenschrift*, February 4, 1897.) By Prof. A. Fraenkel, of Berlin.

Fraenkel presents his subject in the following order: 1. Secondary

changes of the lung occurring in aortic aneurisms which may interfere with the diagnosis. 2. Etiology of aortic aneurisms. 3. Treatment. He reports thirty cases, in seven of which death occurred by perforation, once each into the pleural sac, esophagus, and pericardium, and twice each into the superior vena cava and air passages. He also reports two cases of rupture of such an aneurism into a vein or heart chamber, diagnosed before death. One of these occurred in an apparently healthy man of fifty years. The symptoms were great dyspnea and a sense of constriction about the neck and chest, occurring suddenly after exertion. There was edema, cyanosis, prominence of the subcutaneous veins of the upper half of the body, and entire absence of such phenomena in the lower half. Pulsation was observed over the whole precordia and a loud, harsh systolic murmur was heard over the same region. The patient died in stupor, four weeks after the first attack. The second case was almost exactly similar in regard to the symptoms, but death took place on the 4th day. An autopsy upon this case showed a small aneurism of the aorta, which had ruptured into the superior vena cava. Indurative inflammation of the lung is the commonest of the pulmonary complications of aortic aneurism. The compression of the bronchus, which occurs often upon the left side, produces swelling of the mucous membrane in the region of the constriction. This causes greater obstruction. The consequent retention of secretion starts a chronic inflammation of the bronchial mucous membrane and of the alveoli. The process spreads to the surrounding connective tissue and even to the pleura. The result is a hyperplasia of the connective tissue and desquamation of the alveolar epithelium, which produces a condition of "carnification." Subsequently, the new fibrous tissue contracts and becomes hard and dense, and pulmonary cirrhosis follows. Fraenkel's list includes three such cases. The retained secretion is a medium favorable for the growth of bacteria. A true pneumonia or tuberculosis may occur. The process usually affects the upper lobe of the left lung and may render the diagnosis of the underlying aneurism very difficult. Thus, there is dulness over the entire upper half of the thorax, with suppressed breath sounds. The pulsation is diffused over the whole area, and the signs much resemble those of a tumor of the lung. Fraenkel has observed two such cases, in which diagnosis was impossible. One of them was a cancer of the lung, the other an aneurism. Pulmonary gangrene in this connection is rare. Tuberculosis of the obstructed area occurs in about ¼ of all cases. Here the infection takes place not as a result of the interference with the pulmonary circulation or pressure upon the vagus, but because the retained secretion and the irritation of the bronchial mucous membrane are favorable conditions for the growth of the tubercle bacillus. Fraenkel considers the etiology of aneurism under 3 heads. 1. The mechanical theory, that lesions occur in the elastic tissue of the middle layer of the arterial coat, that destroys the resistance of the vessel wall, and dilatation occurs. These

lesions are caused, according to Manchot, by sudden changes in blood pressure; according to Hilbert, by the changes brought about by age, which are in a sense physiological. The author, while recognizing the importance of such changes, does not consider them the only cause. 2. The inflammatory theory, where areas of round celled infiltration form in the media from irritants brought by the vasa vasorum, which, by its pressure, interferes with the muscular and elastic fibres, and destroys the resistance of the vessel wall. 3. The theory advanced by Thoma, that, under the action of certain deleterious agencies, as syphilis or alcohol, the intima of the vessels loses its elasticity and dilates. Fraenkel holds that aneurism may be the result of any of these agencies, but that no one of them is able to explain every case. He discusses syphilis as an especially important factor. This condition leads to an endarteritis producing irregular areas of fibrous change in the intima and an extensive infiltration of the media. In some places typical granulation tissue appears with scattered giant cells. The syphilitic character of the process is indicated by the frequent occurrence of gummata in the viscera in cases of aneurism with the changes in the arteries described. 11 of the 30 cases reported by Fraenkel had a distinct syphilitic history, or 36%. Welch estimates the proportion to be 60%, and Malmsten 80%. The treatment may be carried on by the introduction of foreign bodies into the sack, by ligature, or by dietetic and medicinal remedies. If there are indications of a syphilitic taint, mercury should be given, preferably by inunction. During this treatment the patient is confined to bed on a restricted diet. Potassium iodide is also given regularly. Fraenkel has seen very quick relief from pressure symptoms by the use or these remedies.

STEELE.

The Voluntary Increase in the Frequency of the Pulse in Human Beings. (*Pflüger's Archiv*, Vol. LXVI., p. 232.) By Th. H. van de Welde.

Stimulated by the observations of Tarchanoff, the author undertook a number of experiments, using as subjects 6 healthy persons of various ages and of both sexes. Differing from the observations of Tarchanoff, however, he did not find that these persons exhibited any abnormal control over the muscles that normally are not subject to voluntary influence, only one of them being able to move the ears to a slight extent. Of the subjects, 4 were able to concentrate their attention for a considerable length of time and during the period of concentration think fixedly upon the rapidity of the heart beat, during which period the rate increased usually about 20 beats per minute, the increase being from 72 to 93, from 72 to 94, from 75 to 98, and from 60 to 74. In another case, where the power of concentration existed in a slighter degree, the pulse rate increased in the first 10 seconds of the experiment from 57 to 90, and then sank to 72; the subject

himself admitted that during the second period of slowing he had ceased to think further of the experiment. A similar condition existed in another patient whose pulse was normal at 70 ; in the first 10 seconds it beat 15 times faster and then sank again. All the subjects appeared as if their whole attention was absorbed in some important matter. There were, however, no other evident signs, such as reddening of the face or increased rapidity of the respiration. The pulse usually remained regular and as soon as the experiment was over declined, at first rapidly, and then more gradually, so that even 3 minutes after the attention had been relaxed it was more rapid than before the experiment was commenced. All the subjects admitted that during the experiments they were conscious of the heart's action. One patient also had the sensation as if making an effort to perform some slight muscular action. Regarding the causation, van de Welde believes that the phenomenon is common to nearly all persons, and depends exclusively upon the activity of the will. It can certainly be considerably improved by practice, as was shown in these experiments. As there are occasionally undesirable sequelæ, it is not well to carry such experiments too far, as some of the subjects of the previous experiments complained of palpitation, and certainly suffered from abnormal frequency of the pulse beat.

SAILER.

The Diagnostic Importance of the Presystolic Murmurs at the Apex of the Heart and Several Symptoms of Aneurism of the Left Ventricle. (*Centralblatt für innere Medicin*, February 13, 1897.) By Prof. A. Kasem-Beck, of Kasan.

The writer calls attention to the fact that presystolic murmurs at the apex has frequently been observed in cases which showed no evidence of mitral obstruction at the autopsy. In one series of sixteen cases, in which the signs of aortic incompentency and mitral obstruction were observed during life, the autopsy demonstrated the absence of mitral obstruction. In another series, with the same physical signs, the only lesion found was an old pericarditis with adhesions. In one case the left ventricle was much dilated. A presystolic murmur is often heard at the apex in cases of uncomplicated aortic insufficiency. The cause of this is the vibrations produced in the anterior leaflet of the mitral by the regurgitating blood from the aortic orifice (so called Flint's Murmur). Picot has described a presystolic murmur in hysteria from spasm of the papillary muscles. In other cases the murmur can exist in connection with dilatation of the mitral orifice. Kasem-Beck reports such a case: A man 63 years of age came under observation with anginoid pains and dyspnea. There was pulsation in the veins of the neck. The apex beat was displaced downwards and to the left, and was extremely strong and heaving. The heart was enlarged to the right and left. The peripheral arteries were thickened and atheromatous. Auscultation gave a loud presystolic murmur at

the apex, with an indistinct first, and accentuated second sound. No murmur at the tricuspid valve. The autopsy showed no narrowing of the mitral valve, but dilatation and insufficiency of both auriculo-ventricular orifices. There was an aneurism, the size of an apple, at the left apex, and widespread aotheroma of the coronary arteries. K. believes that the presystolic murmur was caused by the eddy in the blood stream, produced by the aneurism. He also calls attention to the absence of systolic murmurs in this case. A certain symptom of aneurism of the apex is the strong impulse at the apex and the synchronous weak pulse wave in the radial arteries.

STEELE.

THERAPEUTICS.

Remarks on Vaccination against Typhoid Fever. (*British Medical Journal*, January 30, 1897.) By A. E. Wright, M.D., and Surgeon-Major D. Semple, of Netley.

The object of all vaccination processes is, first, to achieve a degree of immunity which shall be equal to or greater than that which accrues to a patient who undergoes and recovers from an actual attack of the disease; and second, to achieve that immunity without risk to life or health. The first object, so far as is known, can only be satisfactorily achieved by inoculating the patient with the micro-organisms of the particular disease or with their products. The second object may be achieved in one of several ways. The patient may be inoculated with micro-organisms which have lost their virulence for man by being passed through a whole series of appropriately chosen animals; he may be inoculated with artificially attenuated micro-organisms or he may be inoculated with measured quantities of dead but still poisonous micro-organisms. The last method has been adopted in vaccination against typhoid fever, because it possesses certain advantages; first, there is absolutely no risk of producing actual typhoid fever; second, the vaccine may be handled and distributed through the mail without incurring any risk of disseminating the germs of the disease; third, dead vaccines are probably less subject to undergo alteration in their strength than living vaccines. The vaccines are made from agar cultures of typhoid bacilli, which have been grown for twenty-four hours at blood heat. The cultures thus obtained are emulsified by the addition of measured quantities of sterile broth. The resulting emulsion is then drawn up into a series of sterile and duly calibrated glass pipettes. The capillary ends of these pipettes are then sealed in the flame so as to form vaccine capsules. These capsules are then placed in a beaker of cold water which is then brought to a temperature of 60° C. (140° F.) and is kept at that temperature for five minutes. The sterility of the vaccine is then controlled by allowing a drop of the fluid to run out on to the surface of an agar tube which is subsequently incubated. If the

contents of the vaccine capsules are sterile the vaccine is ready for use. In inoculating these vaccines the capsules are first thoroughly shaken so as to distribute the bacteria through the fluid. The contents are then drawn up aseptically into the syringe and introduced into the flank of the patient. The strength of the typhoid vaccine will be determined by the number of bacilli which it contains and by the virulence of these bacilli. The authors have used a culture of such strength that one-fourth of a tube of a twenty-four hour culture constituted a lethal dose for guinea pig weighing from 350 to 400 grammes. They have employed from one-twentieth to one-fourth of a tube. The latter quantity constitutes a somewhat severe dose for man. With the smaller dose the supervening symptoms are slight. With larger doses, one-fourth of a tube, the symptoms are severe; in two or three hours after injection there is a certain amount of local tenderness which gradually increases in severity and extent. A patch of congestion, two to three inches in diameter, develops around the site of the inoculation. Red lines of inflamed lymphatics may be traced upwards towards the armpits. Local tenderness is most marked twelve hours after and disappears forty-eight hours after the injection. The constitutional symptoms consist of some degree of faintness and collapse which make their appearance in two or three hours. There are also nausea, vomiting, anorexia, fever, and insomnia. These symptoms disappear in from twenty-four to forty-eight hours and take place even in patients who have received from forty-five to sixty grains of calcium-chloride crystals which are administered to prevent the occurrence of decrease in blood coagulability and edema. Eighteen inoculations were made, and examination of the blood of these patients at different times shows that that fluid has become in some measure poisonous to the typhoid bacillus, since it agglutinates the bacillus. Experiment shows, however, that patients whose blood possesses a sedimentating power upon the bacilli are not absolutely protected against typhoid, although the possession of a sedimentation power denotes the possession of a certain measure of "bacteria proofness" against the bacterium in question. The injection of small and measured quantities of these dead bacterial cultures involves no more risk to life or health than the injection of a medicinal dose of morphine. The duration of the immunity is not definitely known, but the serum diagnosis ought to give an indication when the immunity is lost. The authors claim that since the symptoms can be controlled by calcium chloride, and since the adequacy of the vaccination can always be controlled by a blood examination, it will be expedient for every one who is likely to be exposed to the risk of typhoid infection to undergo the vaccination.

JOHN M. SWAN.

Formalin an Approximate Specific for Ringworm.

An interesting editorial note has appeared in *Guy's Hospital Gazette*

calling attention to a recent paper by Mr. Alfred Salter on the treatment of ringworm by formic aldehyde, or formalin. This treatment is now so well known in Guy's and has had such a conspicuous success that it should be the ordinary practice of every old Guy's man. There seems to be no doubt that it is the almost specific treatment for the disease, especially in obstinate and hitherto incurable cases. And yet this discovery arose from the annoying fact that the inventor's cultivation of the ringworm microbe were all killed one night through his having left the stopper out of the formalin bottle. So do fates at times turn good out of evil.—*The Therapist*, November 15, 1896.

Remarks on the Treatment of Bubonic Plague. (*British Medical Journal*, January 30, 1897.) By James Cantlie, M.B., of London.

In no disease does one get such immediate results from careful and prompt medical treatment and as a direct outcome of watchful nursing as in plague, in the case of Europeans. Every two patients require an attendant to themselves and this attendant should never lose sight of the patients for a single moment day or night. The much despised legend, "treat symptoms as they arise," is the maxim in plague and the word "promptly" should be added to this. The first remedy to be given is calomel in five or ten grain doses. From the very first onset, or certainly after twenty-four or forty-eight hours, it will be found necessary to stimulate plague patients by alcohol or by medicine. Appetite is usually preserved, but the feeding should be light. Thirst should be relieved by allowing the patient anything within reason. Delirium is best treated by the application of cold to the head. In most cases hyoscine hypodermically in doses of gr. $\frac{1}{100}$ is perhaps the most efficient and safe of the hypnotics. Sometimes morphine must be given and experience has shown that its administration is not so unsafe as to preclude its use. Bromide of potassium may be used without danger. Diarrhea is seldom obstinate and will usually yield to salol, opium and starch enema, or suppository of morphine, gr. $\frac{1}{4}$, and cocaine, gr. $\frac{1}{2}$. If vomiting persists it may be treated by the application of a mustard plaster to the epigastrium, by the use of ice, or by an effervescent draught of dilute hydrocyanic acid and morphine. Hyperpyrexia is exceptional. Antipyrin and phenacetin are such severe depressants that they should not be used. Pyrexia should be treated by sponging. Collapse may be conquered by blisters of mustard or by ammonia. Hypodermic injections of ether must be used freely and frequently. The most useful prescription is one containing carbonate of ammonia and the tincture or decoction of cinchona. Digitalis and strophanthus are unsatisfactory. Camphor, caffeine, and musk may be tried. Strychnine administered by the mouth or hypodermically is of the greatest use. Aconite, quinine, and chloride of ammonium have their uses as has also the inhalation of oxygen. Not much benefit can be gained by

local treatment of the glands. Abscesses should be opened when they point and are fluctuating and should then be dressed antiseptically. Subcutaneous incision of the gland may relieve tension and pain. Belladonna may be applied or poultices may be used to relieve pain until a swollen gland is ready to be opened. Retention of urine often renders the use of the catheter imperative.

JOHN M. SWAN.

Gastric Ulcer treated exclusively by Rectal Nutrition. (*Deutsche med. Woch.*, December 27, 1896.) By E. Ratjen, M. D.

Having become dissatisfied with the methods hitherto employed for the treatment of gastric ulcer, that is, hot applications, liquid diet, and various drugs, either analgesics or alkalies, for 2 or 3 weeks, which, unfortunately, give no absolute assurance of cure, the author accordingly sought for something which would justify him in promising his patients permanent improvement. He therefore determined to experiment more thoroughly with the so-called deprivation cure, that up to the present time only had been resorted to when all other means had proved ineffectual. He diagnoses gastric ulcer from the following symptoms: (1) The period of the appearance of the subjective symptoms of pain after eating; (2) the painful pressure point in the epigastrium and in the back just to the left of the vertebræ column at the level of the twelfth dorsal vertebræ; (3) the hemorrhages of long or short duration. As soon as the diagnosis is made and the patient weighed, he commences the treatment. This consists of withdrawal of all nourishment by the mouth for a period of 10 days, during which time food is administered exclusively by the rectum, and at the same time the patient must observe absolute rest in bed. In case of pain, hot applications are used; no drugs whatever are employed; water and various indifferent teas are used to quench the thirst; occasionally a little cognac is also given. Altogether, he has tried this method in 55 cases, 53 women and 2 men, usually between 15 and 30 years of age. Alkalies are not employed for the reason that the stomach, in a period of rest, does not secrete acid, nor does the author believe that constant alkalinity of the gastric juice is necessary to secure healing. In no case must the soft sound be used during the treatment. One of the contributing causes, according to his experience, is the dislocation of the stomach, which consists of a low position of the greater curvature and sometimes of the lesser curvature. Of course, this condition is the common result of tight lacing.

SAILER.

Lavage of the Blood in Streptococcus Infection (Infectious Endocarditis): Cure. (*Gazette des Hôpitaux*, January 21, 1897.) By P. Dalché.

The expression "lavage of the blood" implies the idea of introducing

into the circulation a fluid which is at the same time harmless and beneficial, and which will relieve the blood of the deleterious principles with which it is charged. In the strict sense of the word the procedure which approaches most nearly to lavage is that which combines transfusion and bleeding. If in the course of a severe infection one is obliged to employ this method of treatment several times in succession, subtracting each day a considerable quantity of blood and replacing it by a saline solution, there is some danger. But the injection of the saline solution alone into the vein constitutes a sort of lavage which is frequently beneficial. In the case of a woman, aged twenty-seven years, who presented symptoms of infectious endocarditis with streptococci in the blood, the author injected a litre of artificial serum, prepared after the formula of Hayem, on five successive days with beneficial results. After the intravenous injection of a marked quantity of saline solution such reactive phenomena occur that it is impossible to consider the polyuria and the toxuria as the only happy results obtained. The sensation of improvement and of well-being, which show themselves after each lavage, the revival of the patient from a typhoid state, and the cessation of the delirium do not depend upon the evacuation of the poison by the more abundant urine alone. The elimination of toxins, their transformation, perhaps (Charrin), and microbic discharges (Lejars), certainly play an important role; but it is also necessary to take into account the stimulation which the organism receives and the effort which it makes to combat the disease. The critical phenomena are more marked after the intravenous injection than after the subcutaneous injection of a given quantity of fluid. Nevertheless, good results have been obtained from the subcutaneous injection of a smaller quantity of liquid in the case of an old man suffering from anuria following a burn, and in that of an old woman who was comatose from grave icterus following hepatic calculi. Whenever, in the course of a severe infection, it is desirable to bring on a crisis, to relieve arterial pressure, or to set up abundant and rapid diuresis, the intravenous is preferable to the subcutaneous route. It is evidently necessary to determine the integrity of the kidneys and of the muscle of the heart, and to observe carefully the volume, frequence, rhythm, and strength of the pulse before establishing the treatment.

JOHN M. SWAN.

Bubonic Plague and its Serotherapy. (*Gazette des Hôpitaux*, January 28, 1897.) By Dr. Roux.

The micro-organism of plague is a short bacillus which is found very abundantly in the enlarged lymphatic glands. In severe cases it is found in the blood, in the liver, and in the spleen as well as in the lymphatic glands. The bacillus is decolorized by the method of Gram. It is easily cultivated upon gelatine and in alkaline bouillon. The disease can be inoculated into the rat and into the mouse. The bacillus is found in the soil

and the rats are infected from this source, the disease proceeding thence to man. It is reasonable to suppose that a good prophylactic measure against the plague would be the destruction of the rats. Under the direction of the author, Calmette and Borel had undertaken to immunize rabbits and guinea pigs before Yersin. Subsequently a horse was immunized and the serum used upon mice. Mice which had received $\frac{1}{10}$ c. cm. of the serum of the immunized horse did not develop the disease when they were infected, twelve hours after, with the bacillus of plague. This serum was therefore preventive and further experiments proved it to be also curative. Yersin, on June 26, 1896, injected 30 c. cm. of anti-plague serum in doses of 10 c. cm. each into a Chinese, aged eighteen years. The injections were made at five, six, and nine P. M. At midnight the patient began to improve and at six o'clock the next morning all the grave symptoms had disappeared, convalescence was established, and cure rapidly followed. In Amoy, twenty-three cases of plague were treated by serotherapy, of which two died and twenty-one were cured. In all twenty-six cases of the plague have been treated by the serum (three in Canton and twenty-three in Amoy), with two deaths, or a mortality of 7.6 per cent. In order to facilitate a cure the serum should be injected early. The serum is powerless when the disease is too far advanced. Yersin used serum which had been sent to him from the Pasteur institute in Paris. He had carried it from Nha-Trang to Hong-Kong, thence to Canton, and thence to Amoy, in the hot season. During these journeys the serum had lost none of its properties.

JOHN M. SWAN.

Antipneumococcus Serum. (*British Medical Journal*, February 27, 1897.) By J. W. Washbourn, M.D., F.R.C.P., of London.

A pony was immunized by the injections of broth cultures of pneumococci which produced swelling at the site of inoculation, with pyrexia, malaise, and loss of appetite. The pneumococcus which was used for the estimation of the strength of the serum was obtained from the blood of a mouse which had died after inoculation with the sputum from a case of pneumonia. When 0.000001 of a loop of this culture was introduced into the peritoneal cavity of a rabbit the animal invariably died of septicemia. In testing the serum, measured quantities were mixed with ten times the minimum fatal dose of the cultivation. The mixture immediately after being made was injected into the peritoneal cavity of a rabbit. The smallest quantity of serum which protected the animal under these circumstances was called a unit. The experiments have shown that 0.03 c. cm. of serum protects against ten times the minimum fatal dose of the culture. Experiments made to show the therapeutic effect of the serum indicate that a single dose of sixty-six units of serum protects when injected five or six hours after the inoculation; but that the same quantity injected as late as eight or twelve hours

only retards the fatal event. The controls died in from twenty-four to twenty-six hours and therefore recovery ensued when the treatment was begun in the first quarter of the disease. Large doses of the serum produce no ill effects on rabbits. Two cases of pneumonia have been treated with the serum. The first was in the person of a male, aged twenty-nine; the disease being confined to the left lower lobe. Seven days after the onset of the disease 20 c. cm. serum were injected (660 units). The following day 660 additional units were injected. Both injections were followed by a fall in temperature and the crisis followed the second injection. Unfortunately this was the ninth day of the disease. In the second case there was a double pneumonia in the person of a male, aged twenty-five years. On the second day of the disease 20 c. cm. serum were injected or 660 units, and a similar amount was injected on the following day. In this case improvement followed the second dose and the pneumonic process ceased its advance after the institution of the treatment. The serum should be injected into the subcutaneous tissue and strict aseptic precautions should be taken. 20 c. cm. should be injected at a dose and it would probably be well to inject more frequently than once daily. The injections should be made twice daily until the patient is convalescent. It is important to commence the treatment as early in the disease as possible.

JOHN M. SWAN.

On the Question of the Absorption of Albumoses in the Rectum. (*Münchener med. Wochensch.*, November 24, 1896.) By Dr. Kohlenberger.

Witte's or Kemmerich's albumoses were given by enema—30 to 40 c. cm. of a 10% solution. Examinations of the urine of the following 24 hours for albumoses, using Millon's reagent, Heller's and the biuret tests and concentrated NaCl solution and acetic acid were always negative, as were numerous tests for peptones (precipitation by ammonium sulphate, biuret test of filtrate). The water used in washing the rectum 4 hours after an enema gave but a doubtful biuret reaction or none and no other reactions. If a stool followed the enema the biuret reaction was less marked than in the enema itself or was absent. Kohlenberger concludes from this that albumoses can be entirely absorbed when administered per rectum and may be well used in artificial nourishment, and that this is so because absorbed in this way they do not, as when injected into the blood, circulate as foreign bodies and pass out through the urine unchanged, but are used in the body-economy.

EDSALL.

Mongolian Medicine. (*British Medical Journal*, February 27, 1897.)

Dr. J. J. Matignon, an army surgeon attached to the French Legation in China, gives an interesting account of Mongolian medicine, based on in-

formation received from a Mongol who is physician-in-ordinary to the living Buddha of Ourga. Medicine among the Mongols is a monopoly of the Lamas. There is a school of medicine at Ourga, where, after a prolonged course of philosophy and Buddhist theology, three years are given to the study of the art of healing. Mongolian medicine is largely derived from Chinese, and, through that, from European medicine as it was two centuries ago. The European strain comes from the old treatises translated into Chinese by the Jesuits in the reigns of the Emperors Kien-Long and Kan-si. Mongols do not dissect, and their knowledge even of the position of the internal organs is vague. The number of diseases is fixed at 440. Works on medicine are very numerous, the chief one being a kind of encyclopedia entitled Khlantap, which is divided into eight sections, and consists of 156 chapters. Their methods of physical examination are like Sam Weller's knowledge of London, "extensive and peculiar." Thus more than seventy varieties of pulse are described. The urine is examined with great minuteness in respect of its color, smell, and clearness, samples passed at many different hours of the day being used. It is also subjected to a kind of auscultation, being beaten with a wooden spatula, and the vessel then quickly applied to the ear. In the case of rich patients the examination is made more thorough by tasting, a procedure which naturally is made the ground of a special charge. Mongols, like practitioners of former days in Europe, profess to be able to diagnose and treat all sorts of cases on the strength of an examination of the urine alone. The treatment is largely internal, and their pharmacopeia is largely composed of vegetable substances. Every year in September the students make excursions under the direction of their teachers for the purpose of culling remedies, which are dried, classified, and catalogued. Aromatic plants, such as cinnamon and benzoin, play a large part in their therapeutics. Animal and mineral substances are also used, but to a much less extent. The Mongol doctor carries his drugs about with him. Each medicament, dried and triturated, is put into a small leather bag, which is properly labelled; some practitioners carry as many as 300 of these bags enclosed in a larger one or in a box with a spoon to measure the doses. Like the ecclesiastical physicians of the Middle Ages, the Lamas are forbidden to practice surgery, although in cases of crushed limbs or other severe injury necessitating amputation they may direct a butcher how to use a knife. They practice venesection however, use poultices for the maturation of abscesses, and vigorous massage for the relief of headache and other pains. Recent wounds are dressed with lichen of the steppes or with deer fat. They use counter-irritation by moxas, acupuncture, and ignipuncture, and they practice wet cupping by means of ox horns. Preparations of sulphur and lead are used as applications in diseases of the skin; and bathing in hot sulphur springs in syphilis. Fish's bile is credited with the power of curing cataract. Human bile, and that of the bear and of the hyena, also frequently

enter into the composition of their medicinal preparations. Anticipating Brown-Séquard, Mongol doctors seek to restore vigor to old men by the internal administration of ram's testicles. "Organotherapy" is also employed. Thus, the flesh of the sheep is given for vertigo, that of the antelope for diarrhea, that of the water rat for nephritis and dropsy, that of the marmot for dysmenorrhea, that of the beaver for spinal diseases and impotence, that of the wolf in diseases of the stomach. They are acquainted with the parasiticide properties of mercury and use it to destroy the vermin with which their countrymen are generally infected. The most prevalent diseases at Ourga are syphilis and skin affections; but typhus, typhoid, malaria, and other fevers are very common. In treating fevers they purge with rhubarb, and when that fails they give enemata or suppositories, the latter being composed of salt and sugar. They also give nux vomica, sudorifics, and ginger, and juniper is burnt round about the patient. Cholera is treated chiefly by acupuncture under the nails, on the tongue and around the anus; and as a last resource by burning the pit of the stomach.

J. M. Swan.

SURGERY.

An Unusual Case of Foreign Bodies in the Stomach: Gastrotomy: Recovery. (*Deutsche medicin. Wochensch.*, No. 4, 1897.) By Fricker.

This case is remarkable for the number and character of the foreign bodies found at the operation. The patient, a hysterical woman of thirty-two years, gave the history that three months before, during an attack of melancholia, she had swallowed numerous objects with suicidal intent, beginning with petroleum and carbolic acid, and subsequently taking needles, glass, spoons, etc. First the results were but loss of appetite and sense of fullness. Soon, however, severe pain followed with grave vomiting. Examination at that time by medical attendants had revealed nothing. When seen by Fricker these symptoms continued, while her melancholia had disappeared. There was a tumor reaching from the left costal border to the crest of the ileum, of smooth surface, hard everywhere except in axillary line where there was fluctuation. Pressure caused vomiting of dark reddish-green material leaving a taste of iron. Temperature 100° F.; pulse 86. Incising over the most prominent portion of the tumor an abscess was reached just below the muscles, containing a crochet needle, 4½ inches in length. A perforation of the stomach, which lay at the back of the abscess cavity and adherent to the parietal peritoneum, was not found. Opening the stomach above the abscess, a large amount of reddish-brown liquid gushed out and he was able to empty the stomach of a large key, a table-fork, two tea spoons, two nails, two hair pins, twelve pieces of glass, a window-fastener, a steel pen, nine needles, and several smaller objects, in all thirty-seven foreign bodies. The subsequent course of the case was

uneventful and she left the hospital in less than a month quite well. Among the fifty-three published cases of gastrotomy for foreign bodies, none approach the array in Fricker's. He mentions, under methods of diagnosis, the use of the electro-magnet, examination of the stomach contents for iron and (most important) skiagraph and as treatment immediate operation whatever the symptoms or the nature of the body swallowed when once the diagnosis is established.

EDSALL.

The Surgical Significance of Gall Stones. (*Johns Hopkins Hospital Bulletin*, February, 1897.) By F. Lange, M.D.

As long as gall stones remain quiet in the gall bladder, they will seldom give rise to any symptoms; but as soon as they become dislodged and commence to travel through the cystic or the common ducts, the typical symptoms will begin. Acute impaction of gall stone in the cystic duct happens not infrequently with solitary stones of larger size. Solitary stones are not always the cause of this affection; but, on the contrary, sometimes quite the opposite condition will be found. If the gall stone passes beyond the cystic duct into the common duct and is arrested there, of course the symptoms of stagnation of the bile will make their appearance. Very frequently, however, inflammation of the gall system, such as cholangioitis, pericholangioitis, or even liver abscess, is associated with it. The principal point of resistance for gall stones is the region of the papilla in the wall of the duodenum. In many instances it has been found that large stones, which have been arrested there, have destroyed the surrounding parts and have formed fistulous communications with the duodenum. From the gall bladder or from any other point in the gall system, through destruction of the surrounding tissues, the stones may find an outlet into a neighboring viscus or through the abdominal wall. A very serious complication that has led to fatal issue in several cases of advanced cholemia is an inclination of the patients to bleeding. Patients who are apt to bleed from cholemia show this tendency while one is incising the abdominal wall. Such patients are, as a rule, much run down in health. The abdominal incision should be made parallel to the border of the ribs. Corresponding to the thickness of the abdominal wall, this incision must sometimes be a very large one, and great difficulty, which is occasionally met with, depends upon the small size of the liver. In occlusion of the common duct of long duration, probably through the influence of pressure, an atrophic condition of the liver tissue will supervene and that organ may be concealed high up behind the ribs. This condition may cause great difficulty on account of the high and deep position of the field of operation. In such a case the excision of the adjacent costal cartilages facilitates the operation very much. On the other hand, an enlargement of the liver may be a great hindrance, especially in

fat persons of short build. The gall bladder should always be drained with a long tube in order to have a siphon action upon the secreted gall; this will act very effectually. Occasionally a blockage will take place on account of mucus or blood clot, and then it will be necessary to change the tube or make a cautious washing through it. Do not inject any irritating antiseptic solution in the gall bladder, because occasionally such a fluid will cause distressing attacks of colic, probably because it may get into the common duct and the hepatic duct and irritate them; saline solution or boiled water are the proper fluids. The bile itself is an antiseptic agent. Always aspirate as much as possible of the contents of the gall bladder through a thick aspirating needle, protecting as much as possible the surrounding tissues to guard against infection.

JOHN M. SWAN.

A Case of Amputation in Middle Age for Albuminuria following Tuberculous Knee: Recovery. (*British Medical Journal*, February 20, 1897.) By J. J. H. Holt, M.B., of Buckly.

The author reports the case of a man, aged fifty-two years, who had suffered from a deformed and discharging knee since the age of twelve. The urine contained a distinct amount of albumen. Amputation was performed between the upper and middle thirds of the thigh. Convalescence was uninterrupted and the albumen steadily decreased in amount so that it is now entirely absent from the urine.

JOHN M. SWAN.

The Treatment by Superheated Dry Air of Stiff and Painful Joints, including the Rheumatic and Tuberculous, at the Hospital for the Ruptured and Crippled. (*Medical Record*, January 3, 1897.) By V. P. Gibney, M.D., of New York.

Dr. Gibney has used the apparatus of Tallerman, of London, in 8 joint cases, and in the paper before us gives the result of his treatment.

Case 1 was one of firm fibrous ankylosis after tuberculous ostitis of the knee. The patient had 7 baths, the highest temperature of which was 280° F. As a result of this treatment the patient has been able to do without apparatus and to use his limb, the motion of which has become much easier and has increased 20°. Pain has been absent and there has been no reaction whatever from the use of the limb.

Case 2 was one of fibrous ankylosis in a tuberculous knee. This patient received 6 baths. The knee has gained 12° of motion and there has been no pain.

Case 3 was one of ankylosis of a deformed knee, the result of tuberculous disease. In this patient adhesions had been broken up under the influence of nitrous oxide. As a result of this operation the patient experienced excessive pain. The limb was at once put into the bath and in 10 minutes the pain was relieved, no anodyne being required.

Case 4 was one of stiff and painful hip following tuberculous disease. After 3 baths the patient has less dread and apprehension on using his limb, and he steps upon it with more security.

Case 5 was one of chronic rheumatic arthritis, in which improvement had already been obtained by the use of massage and traction. Under the hot-air baths the patient has been able to use her hands in feeding herself and in adjusting her hair, after a fashion. The passive movements and the resulting breaking up of adhesions are borne with less evidence of pain.

Case 6 was one of sub-acute arthritis of the knee of traumatic origin. After four baths the patient is able to use his limb with less discomfort, the range of motion has been somewhat increased and he has become able to bear his weight on the limb with less pain.

Case 7 was one of chronic sciatica. After one bath the patient considers himself much better.

Case 8 was one of traumatic arthritis. After one bath an increase in motion of 15° degrees has been gained.

JOHN M. SWAN.

Citrate of Silver ("Itrol") in the Treatment of Gonorrhea. (*Berl. klin. Wochenschr.*, No. 37, 1896.) By O. Werler.

Fifty cases treated with this salt resulted very satisfactorily. It was used in solution of 1 to 8000 according to the following formula:

℞. Itrol 0,025 or gr. ⅖.
Aquæ 200,0 ℥iii.
M. D. in vitr. flav. Sig. Inject into the urethra 4 times a day.

After a short time the strength of the solution is gradually increased 1 to 4000. Itrol should be used as soon after infection as possible; it possesses a vigorous destructive power against the gonococci, penetrating deeply beneath the mucous membrane even where there is no lesion. It causes no irritation nor does it increase the inflammatory symptoms to any appreciable degree.

L. S. SMITH.

Argonin in the Treatment of Gonorrhea. (*Deutsch med. Wochenschr.*, No. 35, 1896.) By A. Gutheil.

Argonin, a compound of caseïn, an alkali, and silver, has been highly recommended for gonorrhea. Gutheil used it in 15 cases, and reports that the gonococci disappeared from the discharge in 9 days, on the average, without any noticeable symptoms of irritation being caused by the injections. After the germs had disappeared treatment with other astringents was continued for 21 days in order to complete the cure.

L. S. SMITH.

NEUROLOGY.

A Case of Typical Associated Movements of the Right Upper Limb with Aphasia. (*Neurologisches Centralblatt*, January 15, 1897.) By Prof. E. Remak, of Berlin.

Remak reports the case of a woman of 64 who, after a slight operation in which chloroform was used, spoke imperfectly, had impairment of memory, and was awkward in the movements of the right hand. These disturbances increased after a fall down three or four steps. Speech became gradually more impaired and the movements of the right arm more incoördinate. At present the patient has partial aphasia and occasionally paraphasia, and is unable to raise the right arm as high as the left, but the grasp of the hand is good. The tendon reflexes in arm and leg are not increased on either side. The lower limb is not affected. In speaking the right hand is automatically opened and closed, the arm is raised, and there are choreiform movements of the shoulder. Under excitement the movements are also seen in the left arm. They occur in the right limb during voluntary movement of the left. Sensation is altered in the right arm. Remak believes there may have been thrombotic softening of the left third frontal gyrus. The movements are peculiar in that they begin in the thumb and then involve the forefinger, the other fingers, arm, and shoulder muscles in the order of the arrangement of the cortical centres. The case is also of interest as showing that associated movements of the arm and hand, which are observed in certain people when speaking, may be unusually prominent in pathological conditions of the speech centres.

SPILLER.

Two Cases of Intracranial Tumor.. (*The Lancet*, February 20, 1897.) By F. W. Eurich, M. B.

In both these cases of brain tumor there was predominance of mental over bodily symptoms, *i. e.*, dementia with more or less excitement, and absence of headache (except in one case as a terminal symptom), of optic neuritis or atrophy, and of vomiting. The first of these cases, in the opinion of the writer, showed that a neoplasm may extensively invade one frontal lobe; may involve the other together with the callosum, and yet give rise to only a moderate degree of mental failure. It is possible that some compensation was effected in this case by the more intact frontal lobe, as the tumor was of slow growth. The case seems to justify the assertions of Oppenheim and others, that tumors of the frontal lobes often cause an early onset of mental impairment. The second case presented much the appearance of general paralysis on account of the absence of headache, vomiting, optic neuritis, and true focal symptoms; and of the presence of profound dementia, general paresis of the extremities and helplessness, with difficulty in swallowing, and unintelligible articulation. The

pupils on admission did not react to either light or accommodation, and the reflexes were normal. Both of these are uncommon conditions in general paralysis, according to Eurich. The knee-jerk was absent late in the disease. A period of convalescence made the diagnosis of general paresis doubtful, for convalescence in the third stage is unknown. Some tumors, as sarcomata and psammomata, may undergo temporary involution under certain conditions, notably during the puerperium. A relapse with a sudden onset of acute symptoms steadily progressing, without convulsions, rendered a paralytic congestive attack doubtful. The patient had had left-sided epileptiform convulsions some six months previously. The diagnosis of cerebral compression from bilateral hematoma, complicating general paralysis, was now made. At the autopsy multiple psammomata of the dura were found. The explanation offered for the convalescence is that the right hemisphere undertook some of the functions of the left, aided by a temporary cessation of the growth in the tumor, and possibly by diminished tension; then sudden, increased vascular pressure may have rapidly brought about the fatal termination.

SPILLER.

PATHOLOGY.

The Secretion and Filtration of the Aqueous Humor and their Quantitative Relationship. (*Graefe's Archiv*, Vol. XLII, No. 4.) By E. Niesnamoff, M.D.

In this paper the author describes a series of interesting experiments made by himself, under the direction of Professor Th. Leber, to determine the conditions modifying the secretion and elimination of the aqueous humor. These investigations were made in part upon eyes recently removed from the human cadaver, but principally upon those of a large number of different animals, both after death and *intra vitam*. The use of an instrument recently devised by Professor Leber, for regulating and measuring the degree of intra-ocular pressure and determining the amount and rate of filtration, removed certain technical difficulties that have hitherto proved a source of inexactitude and possible error in the work of others in this field. The care bestowed upon details and the rigorous verification of results give especial value to this contribution to our knowledge of an important subject. The conclusions arrived at by Dr. Niesnamoff may be summarized as follows: 1. A perfectly pure physiological salt solution filters through the angle of the anterior chamber of the eye after death continuously and at a fixed rate. 2. Increase of intra-ocular pressure is attended by a proportionate increase in the rate of filtration. 3. The different rates of filtration in the eyes of different animals are due to the varying dimensions of the anterior chamber, *i. e.*, of the filtering surface. 4. The use of fluids that are not perfectly pure, or such as contain insoluble substances in suspension, gradually diminishes and often entirely suspends the power

of filtration, a fact that suggests progressive occlusion of the tissue pores. 5. The pigment of the epithelium lining the ciliary processes and the posterior surface of the iris, when present in the anterior chamber, may diminish the power of filtration, and cause increase of intra-ocular tension. 6. Filtration takes place in eyes removed from the human cadaver shortly after death, in precisely the same way as in eyes from recently killed animals. 7. When the intraocular pressure is the same, filtration of the aqueous humor from the eye of any given animal proceeds in virtually the same manner in life as after death, its rate varying with the pressure as indicated by the instrument. 8. The rate of secretion of the aqueous humor is proportionate to the difference between the intra-ocular and intra-vascular pressure. 9. The aqueous humor is secreted by a process of filtration through the coats of the vessels of the ciliary body, the intra-vascular pressure being about twice as great as the intra-ocular.

REED.

The Question of Homology of the Streptococci. (*Centralblatt f. Bakt., Parasit. u. Inf.*, January 9, 1897.) By Costanzo Zenoni, of Turin.

The author reports a case of pneumonia secondary to epididymitis, in which very large streptococci, forming long chains, were found in the pleural exudate. These were cultivated upon various media and showed extraordinary variations in size and in the length of the chains. Injections caused the characteristic symptoms of pyemia and death. The effect was most marked when they were cultivated according to the method of Marmorek for the purpose of increasing their virulence, that is, in blood-serum bouillon, and it was possible to kill mice in 48 hours with $\frac{1}{8}$ of a c. cm. of the culture. In order to test whether it was really simply a variety of the *Streptococcus pyogenes*, a certain number of animals were taken and injected with Marmorek's anti-streptococcic serum; these, together with control animals, were injected at the same time from the same culture, and it was found that the protected animals were not affected, while the control animals were rapidly killed. The author, therefore, concludes that his investigations may be taken as in some degree favorable to the theory of the homology of the various forms of streptococci, and in a secondary sense, as proving once more the protective action of Marmorek's serum.

SAILER.

The Bacillus of Psittacosis. (*C. R. de la Soc. de Biol.*, December 25, 1896.) By Drs. Gilbert and Fournier.

Having had occasion to observe numerous cases of this disease, the authors undertook to discover the specific agent and found a bacillus identical with that discovered in the year 1893 by Nocard in the tissue of a parrot. This organism is short and thick with rounded extremities; facul-

tative anaërobic, motile, and does not stain by Gram's method. It develops rapidly upon the ordinary media; does not liquify gelatin; does not ferment lactose nor coagulate milk. It develops well in media to which carbolic acid has been added; it does not produce indol, and forms small colonies upon Elsner's medium. In spite of its resemblance to the typhoid fever bacillus, it is usually easily distinguished from that organism. Thus, it develops differently upon potato and gelatine; it grows, although feebly, in old cultures of the bacillus of Eberth and it does not give the reaction of Widal. It is remarkable for the power with which it maintains its virulence and vitality and is capable of infecting animals, either when administered by the digestive tract or inoculated beneath the skin. Its similarity to the *Bacterium coli communis* led the authors to suspect that it might belong to the same group, and they made careful investigations of the intestinal contents of a number of normal parrots and found several varieties similar to the para-colon bacillus, but these were usually immobile and were not virulent. They do not, however, deny that it is possible that their bacillus is simply one of these organisms which has acquired virulence.

SAILER.

Modifications of the Serum of Animals Vaccinated against the Oïdium Albicans. (*C. R. de la Soc. de Biol.*, July 10, 1896.) By Dr. Roger.

It has already been shown by Klemperer that cultures of the *Oïdium albicans* are pathogenic for rabbits, causing miliary abcesses in the kidneys. Starting from this fact, Roger found that it was possible to vaccinate the animals against the disease by the ordinary method of introducing attenuated cultures and then using those progressively more virulent. Having thus protected his animals, he made and compared cultures in serum taken from them, and from normal animals. The first difference noted was the extreme slowness of the development of the mould in the immune serum, and it always remained less luxuriant than when cultivated in the serum from the normal animals. If, at the end of four or five days, reinoculation was made from a tube of immune serum upon another tube of immune serum, the culture remained sterile. Under the microscope the growth from the immune serum showed the cells surrounded by an apparently hyaline mass that did not stain, forming a sort of agglutination. This hyaline substance proved to be due to the distension and thickening of the enveloping membrane; the change commencing 10 or 15 minutes after the serum had been inoculated and soon reaching an extreme degree. It appears, therefore, that the reaction of the animal organism to this mould is not dissimular to its reaction to the various bacterial diseases.

SAILER.

The Rôle of the Adrenal Bodies in Resisting Certain Infections. (*C. R., de la Soc. de Biol.*, July 10, 1896.) By Langlois and Charrin.

As it has been claimed that this organism exercises *in vitro* a certain anti-toxic action upon some of the alkaloids, such as nicotine and atropine, the authors undertook a series of experiments in which they determined its action in living animals. Two groups of guinea pigs were taken, one normal, and the other each having had a single adrenal removed, and injected with equal quantities of virulent cultures. The three animals of the first series lived altogether 138 hours; the three of the second series 150 hours. Another series of experiments was made under similar conditions, and although it was impossible to give the length of time the animals survived, as some died during the night, it seemed evident that the mono-capsular animals lived longer than those that were normal. Other experiments were made in which the guinea pig had had the gland removed at various periods before injection of the culture and at various periods afterwards; in all of which it again seemed evident that the normal animals were at a certain disadvantage in their powers of resistance when compared with those that had been mutilated; finally three guinea pigs were taken from which both. adrenals had been removed and compared with the three that were normal Of these the latter all died with a total survival of 25 hours; while the three former recovered. The authors find it very difficult to explain this resistance on the part of mutilated animals, as they are convinced that the adrenal bodies do possess an anti-toxic quality, and they therefore prefer not to indulge in pure hypothesis.

SAILER.

The Discovery of the Bacillus of Eberth in the Feces by the Method of Elsner. (*C. R. de la Soc. de Biol.*, July 3, 1896.) By Dr. Courmant.

If upon the culture media of Elsner, inoculations are made with a mixture of the *Bacillus coli* and the *Bacillus typhosus*, the two grow with a certain degree of difference, nevertheless the colonies of the coli bacillus do not invariably present the brown creamy appearance, being often light and bluish, although always with a slightly brownish centre, and often remaining small, especially those deep in the culture. Twenty cases were examined, 9 of whom were suffering from typhoid fever and 11 from other diseases. Of the latter the bacillus of Eberth was found in none. In 9 cases the colonies of *Bacillus coli* were extremely numerous, and often were nothing more than small glistening points, which it was impossible to differentiate from the typhoid bacillus; and it was only by cultivating a number of the suspected colonies that it was possible to recognize the latter. In fact transition forms between the two forms of colonies are numerous and the method is by no means ideal. In these 9 cases the typhoid bacillus was found in but 2.

SAILER.

Contribution to the Study of the Typhoid Bacillus. (*Ann. de l'Inst. Pasteur*, January 25, 1897.) By Drs. Remlinger and Schneider.

The authors determined to investigate the existence of the *Bacillus typhosus* outside of the human body. In order to do this, they first give a careful *résumé* of the characteristics of the organism, and discuss very fully the possibility of making an absolute diagnosis from the culture. They reach the conclusion that it is possible to make such a diagnosis, particularly by the conjoined use of the method of Elsner, the reaction of Widal, and inoculation of animals that have been rendered immune, either actively or passively. In 37 specimens of water drawn from sewers, springs, and rivers, sometimes from localities where the disease was epidemic, sometimes in the absence of any manifestation of typhoid fever in the neighborhood, they were able to detect the bacillus of typhoid fever 9 times. Of these positive results 2 occurred in water taken from a neighborhood in which typhoid fever was very frequent. 6 others came from a locality where typhoid fever had previously been prevalent, but had at that time ceased to exist. In 13 specimens of earth or dust taken from various places the bacillus was found 7 times; once in material from the yard of a barracks in which typhoid fever existed; once from the dust of a laboratory; once from a barrack room where there was no typhoid fever, and 4 times in the earth from the yard and garden of the Institute. 3 of these specimens were pathogenic for animals. 10 cases not suffering from typhoid fever were carefully examined for the presence of the organism in their digestive tracts. One of these was a case of leukemia, febrile in character with intermittent diarrhea. Numerous examinations of the feces were made with an invariable positive result; the saliva, however, was negative. In another case the disease was acute tuberculosis; in another acute dysentery; two others were patients suffering from chronic malaria without lesions of the intestines. In view of the ubiquity of the organism, the authors conclude that there must be some other element necessary to produce typhoid fever. It is manifest from these examinations that its virulence is extremely variable, and also that the power of resistance of the host must also be variable and that it is only in certain favorable conditions that the development of typhoid fever is possible. They suggest that one of these favorable conditions may be the presence of other organisms.

SAILER.

Professor Koch's Researches on Rinderpest.

In a report to the Cape Secretary for Agriculture, dated "Kimberley, January 31st, 1897," Professor Koch gives an account of his investigations upon the rinderpest up to that time. He first shows that the micro-organisms discovered by Dr. Edington cannot be the cause of the disease, since inoculation with cultures of these microbes did not produce any effects and, further, animals so treated were found to be just as susceptible to subse-

quent inoculation with rinderpest blood. His experimental inoculations on sheep and goats, carried through several generations, did not result in any evidence that the virus had been markedly attenuated by this process; indeed, it would rather seem as if, so far as the sheep were concerned, the cultivation rather increased the virulence than diminished it. On the other hand, in the goats there was evidence of a slow attenuation. His observations upon these animals have led him to the belief that in farms infected by rinderpest, sheep and goats may at first contract the disease in so mild a form as to escape notice, and that the disease becomes more virulent by being continuously propagated through these animals. This view would explain the discrepant statements made as to the liability of sheep and goats to be attacked by the disease. He found that rinderpest blood mixed with glycerin or with phenol lost its infective property, and that although in the case of an animal inoculated with the glycerin mixture the animal was still susceptible to the disease, there was a marked resistance to the effects of subsequent inoculation with unmixed rinderpest blood in an animal treated with the phenol mixture. Dilution with distilled water or normal saline solution carried even to an extreme degree did not appreciably affect the virulence of rinderpest blood. Desiccation of the rinderpest blood did, however, deprive it of its infectivity. The most interesting part of this report is that where Professor Koch shows that animals who have recovered from an attack of rinderpest are not only themselves immune from the disease, as proved by their being unaffected when inoculated with rinderpest blood, but that the blood of such immune animals exerts a protective power—for an animal "vaccinated" with the serum and blood from the immune animal proved to be insusceptible to inoculation with a large quantity of rinderpest blood. He states that further observations will be necessary before he is in a position to say how long this period of immunity can endure or whether it is possible to produce it artificially. He has not been able to find any other animals than ruminants susceptible to rinderpest, numerous experiments having been made with negative results on various species of birds and rodents. Dogs, too, are perfectly immune; but he had not completed his observations upon the pig in reference to this point. In an issue of the *Cape Times* which appeared after the number containing the text of Professor Koch's report there is some interesting correspondence between Mr. H. A. Lawrence, F. T. C., and the Secretary of Agriculture, carried on in October and November of last year, in which it appears that Mr. Lawrence, observing the immunity from a second attack possessed by animals which had recovered from one attack of rinderpest, had suggested that the blood of such naturally immunised animals might be used as a protective agent, a suggestion that is shown by Professor Koch's experiments to be supported by fact.—*Lancet*, March 6, 1897.

A Case of Myosarcoma of the Small Intestine. (*Berlin. klin. Woch.*, No. 7, 1897.) Babes and Nanu.

Sarcoma of the small intestine is so rare that the authors could find records of but 15 cases in literature. Their case, a man of 30 years, presented the following symptoms: Pain in the left flank, constipation followed by diarrhea, emaciation, and a smooth surfaced ovoidal tumor in the left side of the abdomen, movable and tender. Operation showed a tumor of the small intestine, which was removed by resection of the bowel. Microscopically no remains of epithelium could be found. The tumor possessed a distinct capsule, but there were smaller growths of like structure near the main one. In the central portion were hyperemic blood vessels largely stopped up with large round cells, and the chief structure was of round cells, often arranged in columns, separated by bits of fibrous tissue. The nuclei stained only slightly in this portion, while towards the sides more vitality was evident in the frequent appearance of karyokinesis and of intense coloring, and the round cells with large nuclei were arranged in rows as if derived from proliferation of muscle-cells. Many of the muscle-cells were very large, deeply stained, and sometimes showed karyokinesis. In some places were rows of nuclear masses occupying the position of a muscle-cell. The entire tumor apparently arose from the muscular layer. No metastases were recognized, but from the unimportant local symptoms with marked failure of general health a tendency to early metastasis was suspected. The patient was, however, in good health one year after operation. In a foot-note the authors state that since writing the article they have examined a sarcoma from the small intestine of a child. There was, however, no evidence in this of myoma.

EDSALL.

The Rapid Diagnosis of the Löffler Bacillus of Diphtheria. (*Berliner klinische Wochenschrift*, January 17, 1897.) By Fritz Schanz, M. D., of Dresden.

After repeated attempts to discover a quick method of diagnosis between the true and the pseudo-bacillus of diphtheria the writer concludes there are no means by which they can be differentiated within 24 hours. They are without doubt distinct varieties, though belonging to the same family. The non-virulent form has been shown to be one of the most frequent of the saprophytes found in the mouth, and has been demonstrated in 70 % of all cases of simple or follicular angina. The writer asks of what value can be a method of diagnosis that cannot differentiate this micro-organism from the true bacillus in 24 hours. The statement of Martin that the length of the bacillus increases with the virulence is untrue, as Schanz has shown. In the conjunctival sac he found very long non-virulent bacilli morphologically identical with the true bacillus. The pseudo-bacillus forms larger colonies, and does not acidify an alkaline bouillon as quickly as the true

bacillus, but the diagnosis by these means cannot be made within 24 hours. Sponck has developed a means of distinction between the true bacillus and the short non-virulent form (*Bacille court*). The latter has a weak pathogenic action upon guinea pigs, when given in doses of 2 or 3 c. cm. of a 24-hour culture, against which the antidipheritic serum has no action, while against the true bacillus the action is definite and prompt. He also claims pathogenic properties for the Xerose bacillus, and that it can be differentiated from that of true diphtheria in a similar manner. Schanz has carried out a series of observations upon both the short pseudo-bacillus and the Xerose bacillus, and concludes that even the slightest degree of virulence claimed for these bacilli by Sponck is not constant and the method is not a sure one. Branching forms have been described in the true bacillus by O. Fraenkel, and occur in egg albumin cultures, causing H-shaped individuals. Schanz describes exactly similar forms in the egg albumin culture of non-virulent bacilli from the conjunction.

STEELE.

PEDIATRICS.

Transpositio cordis. (*Berl. klin. Woch.*, January 25, 1897. Presented to the *Berl. medicinische Gesellschaft.*)

Reefschläger reports a very interesting case; a child of 13 months, with decided emaciation, showed cyanosis and clubbing of the end phalanges of the fingers and toes, as well as a mild cyanosis of the face, the latter becoming very severe when the child cried. The cyanosis was more decided at birth. The child had had fairly good health. Physical examination revealed absence of the apex beat and heart dulness to the left of the sternum, though the latter existed to the right. A systolic murmur was heard here, plainer at the apex than at the base. The area of liver dulness was absent on the right side, but was present on the left. The liver was indistinctly palpable at the edge of the ribs on the left side. The child while under observations developed a basilar meningitis from which it died. The autopsy showed a tuberculous meningitis which had its origin in some enlarged caseating bronchial glands. There existed a miliary tuberculosis of the other organs. Examination of the abdomen showed the spleen to be on the right side, the right lobe of the liver and the gall bladder on the left, the cardiac end of the stomach on the right, the pylorus on the left, the cecum with the vermiform appendix on the left, and the sigmoid flexure on the right. In the thorax the relations were exactly reversed. The left lung had 3 lobes, the right 2. The aorta was to the right, the two venæ cavæ to the left. The latter emptied into the auricle lying to the left, while the pulmonary veins emptied into the auricle lying to the right. The heart was exactly in the middle of the thorax, more to the right than normal. The apex beat was in the median line. Examination

of the heart itself showed many different sized foramina in the interauricular septum. It contained but a single ventricle, which was completely closed to the left auricle but open to the right. The aorta sprang from the middle of the base anteriorly and the pulmonary artery from a point opposite to it posteriorly. The direction of the blood stream was out of the venæ cavæ into the left auricle and then through the foramina of the septum into the right auricle. After here mixing with the blood coming from the pulmonary veins it passed into the ventricle from whence it was driven out, part through the aorta and part through the pulmonary artery. A remarkable feature of the case is that the child lived for one year and eight months without any especial disturbance.

S. M. Hamill.

The Incontinence of Urine in Childhood. (*Gazette des Hôpitaux*, January 9, 1897.) By Rochet and Jourdanet.

The authors divide incontinence of urine into two classes: first, symptomatic incontinence; and second, essential incontinence. Cases of symptomatic incontinence may be further divided: First, into those depending upon typical nervous disease or characteristic cerebro-spinal lesion, such as are seen in epilepsy, spina bifida, Potts' disease, transverse myelitis, or infantile ataxia. Second, those depending upon diseases of the bladder itself, such as vesical calculus, tumor of the bladder, or exstrophy of the bladder. Third, those due to malformations of the urethra or of the penis, such as hypospadias, epispadias, phimosis, atresia of the meatus, or certain urethral tumors in the female. Fourth, those due to alteration of the quality of the urine, such as albuminuria, hyperacidity, or excessive amount of urates. Fifth, those due to irritative lesions in the neighborhood of the bladder, such as oxyuris of the vagina or of the anus, rectal polyps, etc. The so-called essential incontinence is no more essential than the symptomatic incontinence, since, while depending upon a single primary cause, such as hysteria or simple neuropathy, it is also dependent upon very varied secondary causes which, in their turn, depend upon the clinical aspect of the case with which it has relation. First, there is a series of cases which are due to an abnormal exaggeration of the sensibility of the muscular fibres of the bladder to distension. Second, there is a series of cases which are due to an abnormal exaggeration of the sensibility of the deep urethra. Third, there is a group of cases in which the incontinence is due to atony of the urethral sphincter muscle. And finally, there is a group of cases in which the incontinence is due to retention. The authors have seen three children who complained of incontinence of urine, and, upon examination, the bladder was found dilated and the membranous urethra was in such a condition of spasm that it was necessary to induce anesthesia before that portion of the canal could be examined with a metal instrument. These cases of retention are produced by an urethral spasm of neuropathic

origin. The treatment of this condition is that of the neurosis itself. If there be abnormal excitability of the bladder, belladonna should be used. If there be hyperesthesia of the mucous membrane of the bladder or of the deeper portion of the urethra, local applications of cocaine to the deep urethra and even simple catheterism are indicated. In cases of incontinence from anesthesia of the urethra cauterization of the posterior portion of the urethra has been proposed. In cases of atony of the urethral sphincter, strychnine is indicated, and Guyon has advanced the application of electricity to the atonic muscle. In order to combat psychic influence, methods should be adopted by which the patient is aroused several times during the night to empty his bladder. It is not necessary to punish or frighten the patient, except in the case of one who has been improperly brought up. Hypnotism has been suggested. In cases of retention of spasmodic origin the daily passage of sounds will be found very beneficial. In some cases it may be necessary to apply electricity to the body of the bladder in addition to this treatment, or even to use slightly irritant or caustic intravesical injections.

JOHN M. SWAN.

Symmetrical Malformations. (*Am. Jour. of Obstetrics and Diseases of Women and Children*, March, 1897.) By Arthur Stern, M. D.

Stern reports a case of perodactylus symmetricus in which the middle finger was wanting. The child is now 6 years old, has always been robust and, in spite of the deformity, uses her hands with perfect freedom. There was no hereditary tendency. An interesting fact was that the mother became frightened during her pregnancy by a live lobster and attributed to this the occurrence of the malformation.

S. M. HAMILL.

Acute Retro-Pharyngeal Abscess. (*Finska Läkaresällskopets Handlingar*, Vol. XXXVIII., abstracted in *Le Progrés Médical*, January 16, 1897.) By Dr. A Clopatt.

C. reports 6 cases occurring in children. He gives a description of the lymphatic glands found in the retro-pharyngeal cellular tissue and their avenues of communication with the mouth, nose, and pharynx. The cause is probably to be found in an affection of the skin or the mucous membrane of some one of the cranial cavities. From these the inflammatory substances (microbes, most often staphylococci) pass through the lymphatic vessels and lodge in the retro-pharyngeal glands or surrounding cellular tissues, giving rise to inflammatory and suppurative changes. It is more frequent in boys than in girls, and occurs most often in the first infancy. In C.'s cases three were under one year, two under two years and one, two years. The condition is sometimes secondary to inflamed or suppurated lymphatic glands in the neck. Angina, stomatitis, coryza, purulent otitis, and affections

of the skin, eczema for instance, act as causative factors. Measles, scarlatina, diphtheria, pertussis, and erysipelas are mentioned as uncommon causes. In one of C.'s cases purulent otitis and in another probably influenza was responsible for the condition. The symptoms are difficult deglutition and respiration, head held stiff, and pain on motion. In some cases a swelling forms in the neck under the angle of the jaw. If the disease develops slowly the symptoms are not as striking as in the acute cases. It sometimes develops quickly and gives rise to violent pains. Edema of the glottis, septicemia, and descent of the pus into the cavity of the thorax are among the complications. If spontaneous opening occurs there is danger of suffocation. The prognosis is good if the condition is early recogonized and properly treated. Croup, diphthertic paralysis of the muscles of deglutition, hypertrophy of the tonsils, and edema of the glottis, are the conditions which most resemble retro-pharyngeal abscess. C. advises digital exploration as a valuable aid to diagnosis. The treatment consists in local blood letting and local applications of ice and iodine early in the attack and incision at once if suppuration occurs. C. incises from within with the bistoury, using a finger of the opposite hand as a guide in very young children. The abscess shows a tendency to reform, in which event secondary incision is demanded. The author mentions the method of external incision advocated by Burckhardt and Bellon-Pollard, but considers the internal method the safer.

S. M. Hamill.

I. A Case of Bromoform Poisoning. (*Archives of Pediatrics*, February, 1897.) By W. F. Cheyney.

II. Treatment of Poisoning by Bromoform. (*La Semaine Médicale*, December 30, 1896.) By Dr. P. Czygan.

I. Cheyney administered to a child of 3 years suffering from pertussis, 3 drops of bromoform in a mixture of alcohol, syrup and water, every fourth hour. The mother noticed that the last dose contained in the bottle had an oily appearance. About 3 hours after its administration the child suddenly complained of feeling dizzy and fell. She remained conscious for a time and acted like one intoxicated; she was jolly, laughed without cause, her head wobbled; she talked freely, although her speech was thick and unintelligible. Shortly she began to vomit and soon became unconscious. The body was limp and relaxed, the cheeks and lips had a natural rosy flush, the pupils were markedly contracted and failed to respond to light; the respirations were 20 per minute and regular; the pulse was weak, regular and 105 per minute; the breath smelled of chloroform; the child was given an emetic and a hypodermic injection of $\frac{1}{120}$ gr. of strychnia. Six hours after the drug was given the child had recovered completely. The bromoform had precipitated in the mixture and the greater part of it was consequently given in the last dose.

II. A child of 2½ years was accidentally poisoned by from 5 to 7 grammes of bromoform, and quickly passed into profound coma. Czygan administered hypodermic injections of ether, various forms of cutaneous excitation, and artificial respiration. This induced a marked amelioration of the pulse and respiratory symptoms, but some hours later, even though 4 grammes of ether had been injected several times, the pulse again grew feeble and the cyanosis augmented. He then injected subcutaneously one and a half grammes of tr. of nux vomica in 5 doses in the space of an hour. This rapidly raised the pulse, dilated the pupils, which had continued contracted, and re-established their power to react to light and also restored the corneal reflex. At this stage the application of the Faradic current caused the child to cry, open its eyes, and recognize its surroundings. The coma had endured for five hours. Recovery was complete.

S. M. Hamill.

Parenchymatous Myocarditis in Childhood. (*Rev. mens. des Maladies de l'Enfence*, December, 1896.) By Weill and Barjon.

These authors report 4 cases of this condition occurring in children of from 9 to 14 years. Chronic endocarditis existed in all cases, 3 of rheumatic and one of undetermined origin. Clinically, the first case showed mitral and tricuspid insufficiency and obstruction, the second and third mitral insufficiency and the fourth pure mitral obstruction. In 3 of the cases death occurred during or closely following upon recurrent rheumatic attacks with evidences of a general infection of a febrile nature and gradually failing heart. The course in the fourth case was the same, the result of an erysipelatous infection. In case I. the autopsy showed chronic endocarditis without any trace of recent lesion. The histological examination revealed a parenchymatous myocarditis. In case II. the autopsy showed chronic endocarditis with no trace of recent lesion; on the visceral pericardium were some very localized recent small yellowish vegetations. Bacteriological examination of blood taken from the basilar vein gave negative results. Histological examination was made of the walls of the ventricles and auricles, their partitions and the mitral valves. They showed no evidence of recent endocarditis. In all the sections examined there were diffuse lesions attacking exclusively the heart muscle fibres. There was no trace of sclerosis, no lesion of the connective tissue. The muscle fibres, on longitudinal section, presented a tubular appearance, the central portion being clear, the borders having taken on a reactive coloring. Here and there the central portion showed nuclei decidedly colored and of irregular form. In places and over small extent the muscle fibres is plain, as if the central lesion had been interrupted. Under strong magnifying power the longitudinal striation of the fibres is less clear, the transverse striations are thinned in places. The nuclei of the fibres are surrounded on all sides by a bed of granular protoplasm which is prolonged

on the top and bottom, in the direction of the fibre, in the shape of cones. This protoplasm is colored feebly by reagents. It acts as an enlargement and elongation of central protoplasmic substance which surrounds the nucleus in the normal state. There is no fragmentation or dissociation of the muscle-fibres. On transverse section the areas of Cohnheim show in their centre a clear irregular zone surrounded by a thin bed of contractile substance disposed as a crown at the periphery. If the section extends through the nucleus it is separated from the muscular substance by a clear zone. Under a high power the elementary fibrils are seen to be separated, hollow in their centre, and tubular. Sometimes they are scattered over the area of Cohnheim as if the central or middle situated fibrils had been left intact through the expansion of the central protoplasm. The nuclei are very numerous, unequal in volume, most of them of large dimensions, regular contour and taking on an elongated oval form. Some are flattened in the form of slabs and answer the description of the "Kernplatten" of Ehrlich. This lesion is disseminated and has been seen in different parts of the heart. The muscle fibres are more flattened than hypertrophied and they seem to be multiplied. In case III. the autopsy showed chronic endocarditis with a rather recent pericarditis. Histological examination revealed the lesions of parenchymatous, myocarditis but less prominent than in case II. and not so diffuse. In case IV. the myocardium seemed normal, but on examining cut sections a parenchymatous lesion of the muscle fibres was found. It was quite advanced and diffuse in different parts of the organ, in detail resembling case II. The authors conclude on the ground of these observations: 1st. That there exists in infants an acute parenchymatous myocarditis, especially in the course of a chronic endocarditis. 2d. This myocarditis seems to be derived from an infection provoked by rheumatism and probably by other general diseases, certainly by erysipelas. 3d. It manifests itself by an asystole of from some days' to some months' duration. It is characterized symptomatically by the absence of all modification of the cardiac rhythm. Anatomically there exist a parenchymatous myositis with development of protoplasm at the expense of contractile substance, dissociation and thinning of the elementary fibrils, proliferation hyphertrophy of the nuclei, and diminution of the muscular striæ, and absence of interestitial or vascular lesions.

S. M. Hamill.

OBSTETRICS AND GYNECOLOGY.

Removal of a New Growth from the Liver. (*Deutsche med. Wochenschrift*, January 21, 1897.) By Dr. Jacob von Rosenthal.

The patient, a married woman, 41 years of age, had suffered for 6 weeks with pain, vomiting, and rapid loss of strength. Palpation showed in the lower abdomen a hard, round mass the size of a child's head, movable upwards and sideways. The boundaries of the liver were appar-

ently normal, and there was tympany between that organ and the tumor. Vaginal examination revealed no connection between the mass and the uterus. The diagnosis rested between a dermoid and an omental tumor, but on opening the abdomen it proved to be a pedunculated growth from the Spigelian lobe of the liver, bluish-brown in color, and rough and uneven on its surface. A ligature was placed as high up on the pedicle as possible. The tumor was then cut off by a wedge-shaped incision and the stump sewed up with a continuous suture and fastened extra-peritoneally in the abdominal wound. Microscopically, the new growth was found to be an angioma-fibromata. L. S. Smith.

The Value of Antistreptococcic Serum in the Treatment of Severe Puerperal Septicemia. (*Br. Med. Journ.*, October 31, 1896.) By John D. Williams, M.D.

As a result of the serum treatment of 6 new cases that he reports and of 8 others that he has collected from the literature, Williams makes the following summary: (*a*) Of the 14 cases, 2 ended fatally. The 5th day after labor was the earliest on which the serum was used, the latest the 19th. In six the labor had been instrumental; in one lingering, in two normal. (*b*) In regard to the general effects of the serum, he finds that the skin became moist, perspiration was induced, the lips and tongue lost their dryness, the lochia and lactation were re-established, and delirium and insomnia disappeared. In three cases there were no good effects. Vinay believes that the greater effect is produced when the serum is injected in the evening, and the earlier it is given after the infection. (*c*) Effect on temperature and pulse. In all except the three cases mentioned above, the temperature and the frequency of the pulse were reduced in from 6 to 24 hours, often, though not always, to rise again later. (*d*) Complications and fatalities. Of the two cases ending fatally, one received 20 c. cm. daily for 3 days without effect, the temperature remaining high until the end. The other received 40 c. cm. spread over 4 days; her temperature came down, but she died 2 days later during convalescence. The dose of serum was not large enough to have caused death, unless that particular sample was much stronger than others used. If an erythematous rash appears on the chest it requires no treatment. Lobular pneumonia appeared in one case, suggesting the idea that the serum had not been properly filtered. (*e*) Mode of administration. In no case was there any local disturbance, the serum being injected with all antiseptic precautions into the areolar tissue in the abdominal wall. (*f*) Dosage. The maximum safe dose has not been determined. There should be a standard strength recognized by all bacteriologists. The largest dose used by Williams was 35 c. cm., but Kennedy in the case reported by him used 45 c. cm. The best results seem to have been obtained by a large initial dose followed by smaller ones at intervals of 12 to 24 hours. The British

Institute of Preventive Medicine fixes the initial dose of its serum at 20 c. cm., but much larger doses have been given without bad effects. (*g*) What cases are suitable? As puerperal fever may be caused sometimes by microbes other than the streptococcus—*e. g.*, the *Gonococcus*, *Bacillus coli communis*, staphylococcus and the Talamon-Fraenkel coccus, we can make sure that we are dealing with a case of streptococcic infection only after a bacteriological examination and unless this is done we cannot be certain that the case is a suitable one for the use of the serum. As the disease is at first a local one, local treatment should be carried out in connection with the use of the serum, the uterus should be curetted carefully and douched at frequent intervals.

L. S. SMITH.

Demonstration of a Hair Pin in the Female Bladder by means of X-Rays. (*Centralblatt für Gynäkologie*, January 9, 1897.) By Dr. Seiffart.

The sensitive plates used consisted of strips of glass 3¾ cm. by 17 cm. rounded at one end, covered with a gelatin film, wrapped in black paper, and then covered with a rubber condom to keep out any moisture. The plate was introduced into the vagina of the patient lying in the dorsal position with her thighs strongly flexed. The Crookes' tube was suspended directly over the centre of the region of the bladder. Eight minutes' exposure produced a sharp outline of the pin, which was removed two days later through the dilated urethra.

L. S. SMITH.

Contribution to the Pathology and Therapy of Gonorrhea in the Woman. (*Arch. f. Derm. u. Syph.*, Vol. XXXVI.) By H. Schultz.

The author, after reviewing the pathology of gonorrhea in women, discusses the various modes of treatment advocated by the different authorities on the subject and comes to the following conclusions: 1. About ⅔ (64.8%) of the prostitutes actually have gonorrhea. 2. In chronic cases the discovery of the gonococcus is the only sure diagnostic sign. 3. At present we may exclude gonorrhea after 3 or 4 negative microscopical examinations made at regular intervals. 4. The normal cervical canal and uterine cavity contain no bacteria. 5. In prostitutes and women that indulge frequently in sexual intercourse, gonorrhea occurs usually in the cervix and urethra simultaneously. The ratio of frequency with which it occurs in either of these localities alone is about the same. Gonorrhea in the rectum and uterus is much less frequent; in the rectum alone it is a rare exception. 6. In cervical gonorrhea, the gonococci are found in the uterine secretion in only a small number of cases. 7. In only a small percentage of diseased adnexa following gonorrhea were the gonococci found in the uterus. 8. Therefore we may suppose that after a certain time these germs die when shut up in cavities like the

uterus, tubes, and Bartolini's glands. 9. Legal prophylaxis, as heretofore practiced, is inadequate and should certainly be improved. 10. With the necessary patience and knowledge of the specialty a great number of cervical and uterine gonorrheas is curable, and in the majority of cases the disease is so far capable of improvement that at least the danger of infection may be reduced to a minimum. 11. Braun's syringe, armed with an aluminium nozzle, is better adapted to the treatment than Playfair's applicator. 12. The best results in cervical and uterine gonorrheas were obtained with argentamin; with it the secretion was diminished, the septic yellowish mucus became "glass like," and the gonococci disappeared from the discharge. 13. A dilatation of the cervix is a necessary preliminary to intra-uterine treatment when the cervical canal is too small to permit the easy reflux of fluids injected into the cavity. 14. Infection of the adnexa can be treated only by operation, but we should wait as long as possible that the inflammatory tubal process may subside, and in the meanwhile the uterine and cervical disease may be treated.

L. S. Smith.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,

Of the Philadelphia Bar.

LEGAL RESPONSIBILITY OF A SURGEON FOR PURSUING AN OPERATION BEYOND THE LIMITS FIXED BY THE EXPRESS DIRECTIONS OF HIS PATIENT.

An action for damages was recently brought in the High Court of Justice, Queen's Bench Division, by Miss B., a hospital nurse, against Dr. Cullingworth, senior obstetric physician in St. Thomas's Hospital, London, who had performed on the plaintiff the operation of double ovariotomy, two years before.

The plaintiff's case was presented in two ways: First, that the operation as performed was expressly forbidden by her; and, second, that the operation was unnecessary. The evidence for the plaintiff tended to prove that she distinctly forbade the surgeon to go beyond the single operation; and that, in consequence of his having exceeded his instructions and performed the double operation, she had been compelled by conscientious scruples to break off her engagement of marriage.

In behalf of the defendant, it was contended that she had given at least tacit consent to whatever operation might, in his discretion, prove necessary; and that, under the circumstances of this case, his course in removing both ovaries was justified.

The specific point presented for determination by the Court and jury was whether a surgeon is justified in pursuing an operation beyond the limits fixed by his patient. In other words, does the law give the surgeon the right, and does it therefore become his legal duty to disregard the known and expressed wishes of his patient when he, in the exercise of his best judgment, considers such course to be best for the life or health of his patient?

In behalf of the plaintiff, Sir T. Spencer Wells, recently surgeon to the Queen's household, consulting surgeon to the Samaritan Hospital for Women, the author of a book on ovarian diseases, and who had performed the operation of single ovariotomy more than twelve hundred times and of double ovariotomy about fifty times, testified, after having read Dr. Cullingworth's notes and assuming that they gave a correct description of the patient's condition, that in his opinion it was not necessary to remove the left ovary—there was no danger to the plaintiff's life in leaving the left ovary. He had operated twice, once on one ovary and again on the other, in several cases. The ordinary practice of the medical profession was not to operate without the consent of the patient. It was usual to hold a consultation with another medical man before removing both ovaries.

On cross-examination, he testified that he had never examined Miss B. He did not aver that there was any negligence in performing the operation or any want of skill on the part of Dr. Cullingworth, whom he knew by reputation to be a skillful and careful surgeon. He thought Dr. Cullingworth was the better judge as to the necessity for the removal of the second ovary in this case. From the notes, which were merely notes of what the Doctor kept in his case book of what he had observed, there was no doubt that the right ovary ought to be removed. The notes said the "left ovary was thickened and opaque." The necessity for removal would depend on its thickness and opaqueness. He did not know how thickened and opaque it was in this case. If the defendant had had a free hand he would not say it would have been improper to remove the left ovary if it was in the state described in the notes. He did not think it would be proper for a surgeon to do nothing if he found both ovaries diseased.

On re-examination he said that he saw nothing in the description of the case to make Dr. Cullingworth disregard the strong wishes of his patient not to have both ovaries removed. From the description of this case in the notes, he did not think there could have been so much thickness and opaqueness as to necessitate the removal of the left ovary. Only one or two per cent. of patients died under the operation of abdominal section.

Dr. Bedford Fenwick, surgeon to a hospital for women, said that he had examined the plaintiff on July 16, 1896, and had read Dr. Cullingworth's notes of the case and, taking them as the description of what had occurred, he did not think it necessary that the left ovary should have been

removed; there was nothing to justify the doctor in overriding the patient's strongly expressed wish not to have it removed. If it had been left, it might have shrivelled up, or it might have become enlarged and dangerous to her; and in the latter event she would then have had the option of having it removed. He thought the mortality was slightly higher than Sir Spencer Wells had put it, as he was probably giving his own cases in which the mortality was low. The patient's consent in ovariotomy is invariably asked some time before the operation.

On cross-examination he testified that the plaintiff had been a patient of his some years before, and he had examined her in 1892 or 1893. From the notes he concluded that the right ovary ought to be removed; it was a source of danger and trouble. He would not have undertaken to perform an operation on the understanding that if both ovaries were diseased he was to remove neither. As to the propriety of removing the left ovary, Dr. Cullingworth, who performed the operation, would be a better judge than he was after reading his notes. He considered it a very good rule to look at the second ovary when operating on the first. In 1893 he had formed the opinion, from her manner and behavior, that the plaintiff had [no respect for the truth, and had written to Dr. Cullingworth to this effect. He did not then believe it possible that she had been operated on without her consent; now, he was afraid he believed it possible. In 1896, when the plaintiff asked him to testify, she had calmed down, and he then believed she had respect for the truth. In 1893 he thought she had given her deliberate consent to have both ovaries removed if necessary; but in 1896 he had seen in Dr. Cullingworth's notes that she had a strong wish not to have both ovaries removed, and had noticed the course pursued in the operation.

Dr. Charles James Cullingworth, the defendant, testifying in his own behalf, said that he had been in practice for thirty years, formerly professor of obstetrics in Owens College, Manchester, and for the eight years preceding this action, senior obstetric physician in St. Thomas's Hospital. Previous to 1892 he had known the plaintiff's sister, who had been a nurse at St. Thomas's Home, and at her solicitation examined the plaintiff and told her that an operation was necessary, and explained fully the effect of the operation. The interview lasted nearly an hour. He told her the operation of removing the diseased ovary on the right side would not interfere with her power of getting married or of getting children; but that if, when the operation was proceeding, it was necessary to remove the left ovary then it would prevent marriage from being fruitful. She had told him she was engaged to be married or about to be engaged, but declined the doctor's offer to write to the gentleman. After the conversation she said she could not bring her mind to have the left ovary removed. He said as far as he could judge by preliminary examination it would not be necessary, but that no one could be sure until the parts were exposed

to view, and that he could give no guaranty that one ovary only was diseased, and no surgeon who knew his business would give such a guaranty. He told her it was a matter entirely for her, and she must think it over and decide, and she said she would never have it done. He then left the room.

On Saturday, August 13, 1892, the plaintiff's consent to the operation was communicated to him in a letter by Dr. Bidwell. On Sunday he visited the patient and wrote down an account of her illness. She said she would not consent to have both ovaries removed. He said there was strong reason for thinking the question of removing the second ovary would not arise, but that he could not be sure until the operation was proceeding, and he could not bind himself by any promise not to remove the second. He also said that until the ovary was actually in view it was impossible to be certain what the condition of it was. He would not have undertaken the operation unless he understood that he was unfettered. On the following morning, at the time fixed for the operation, he went into the operating room, and the plaintiff was brought in. Dr. Bidwell, Dr. White, the nurse and Mrs. H. were present. The plaintiff's sister came with her, but did not remain in the room. After the plaintiff came into the room she said, "Dr. Cullingworth, if you find both ovaries diseased you must remove neither." To which he replied, "You really must leave that to me, nurse; I know your wishes; you may be sure I shall remove nothing that I can help." She made no reply, and got on to the operating table and took the anesthetic. At the time of this conversation she appeared in the full possession of her faculties. Had she raised any objection to his statement he would not have proceeded with the operation.

After ascertaining the condition of the right ovary he thought it absolutely necessary to remove it. If he had left it her life would thereby have been placed in the gravest danger, and he, therefore, removed it. After an examination of the left ovary he saw that it was diseased. He did not think it would have been possible to examine it before removing the right; he did not try. He said to his assistant that it was a serious complication, and, in view of the patient's expressed wish, he would have to think for a moment what course to pursue. It was suggested that, as the plaintiff's sister was outside the room, it might be a way out of the difficulty to confer with her; but he said that he had accepted the responsibility of the operation, and it would not be fair to put any of it on the plaintiff's sister, as she could not possibly judge of the risk incurred by leaving the ovary. Eventually he decided to dissect the diseased portion of the ovary away, unless it could be done by puncture. After making an incision he found the disease to be of such a nature as to make it impossible to puncture it and leave it. He then attempted to remove the cyst, leaving a portion of the ovary, but finding this impossible he removed the

ovary. In his opinion, in the interest of the patient and to preserve her life, it was absolutely necessary to remove it. He used every means to save it, but it was not possible, in his opinion, to do so. He had performed ovaritomy 350 times in the last 25 years. The operation, from a surgical point of view, was successful, and, in his opinion, undoubtedly saved the plaintiff's life.

He had put off his holiday for a week in order to perform the operation and to oblige the plaintiff's sister. A week afterwards, when he saw the patient at the Home and told her, in answer to her question, that both ovaries had been removed, she became very excited and called him opprobrious names. He tried to reason with her, and threatened to put her in a ward by herself, as her conduct was such as to disturb other patients. He performed the operation merely out of regard for the sister and without any fee.

On cross-examination the defendant admitted that as soon as she discovered both ovaries had been removed she told him that he had overstepped his bounds as a medical man and sooner or later would suffer for it. Over and over again the plaintiff said she would not submit to have both ovaries removed. She never uttered a word agreeing to such an operation. He did not know she wished her sister to be present during the operation He had never asked the opinion of the patient's relatives in the middle of an operation. Before performing an ovariotomy he would get the consent of the patient's husband or mother. After the operation, on every occassion she met him, she upbraided him and said he had acted against her instructions. He could not say whether she would have lived ten years if the left ovary had not been removed, but he thought it unlikely.

He got her consent in a letter from Dr. Bidwell saying she consented. She never told him directly that she consented to his taking out the second ovary. She had thought the matter over after the first interview and then he received the letter from Dr. Bidwell saying she consented. On the Sunday she was wavering. She came into the operating room knowing his position; the mere fact of her coming into the operating room showed her consent. When she came into the operating room and said if both ovaries were diseased he was to remove neither, that showed him she was not in a fit state to discuss the question. He agreed with Sir Spencer Wells that the consent of the patient ought to be obtained before the operation.

On each occasion when the plaintiff had said she would not have both ovaries removed he had said she must leave herself in his hands.

He complained very much of his notes being handed to the other side, as they were insufficient to form an opinion on. He thought Sir Spencer Wells testified on insufficient knowledge.

Dr. Bidwell testified he was in charge of St. Thomas's Home in August,

1892, and wrote a letter to Dr. Cullingworth telling him that the plaintiff had consented to the operation. He believed he had received that intimation from the plaintiff herself. When the plaintiff came into the operating room she said if both ovaries were diseased she would have neither of them removed. Dr. Cullingworth said she must leave that to him : he would do what was best for her. The plaintiff made no reply to that, but lay down and took the anesthetic. At the time of this conversation she was excited. He was present and assisted at the operation. In his opinion both ovaries were diseased and in his judgment Dr. Cullingworth did right under the circumstances.

On cross-examination he could not remember whether or not she said she would never consent to the second ovary being removed.

Dr. White testified that he was present at the operation as an anesthetist and remembered Dr. Cullingworth saying, "You must leave that in my hands." After that Miss B. got on the operating table.

Dr. Galabie, senior obstetric physician at Guy's Hospital, testified that in his opinion the removal of both ovaries was necessary, assuming Dr. Cullingsworth's description of the case was correct. On cross-examination he said that he had never heard of an exploratory incision being made if there was not to be any operation, even in case an operation was thought necessary.

Dr. Herman, examiner to the Universities of London and Oxford, testified that in his opinion the removal of the left ovary in this case was necessary. He thought it would have been improper for Dr. Cullingworth to have left it in the condition he had described it. The patient would have died from it probably. He thought that with the ovaries as described she would have been sterile before the operation, so that, so far as marriage was concerned, the operation had no effect. He had himself met with cases where he anticipated having to remove one ovary and found it necessary to remove two. In such cases he had taken upon himself the responsibility of taking out the other ovary. On cross-examination he could not say she might have lived ten years with that organ, but he did not think it likely.

Mr. Lawson Tait, consulting surgeon to several hospitals for diseases of women, and who had written several books on the subject, and who had likely removed more ovaries than any other medical man, was strongly of opinion that it was absolutely necessary to remove both ovaries. He thought that the effect of the operation was to restore the patient to health and to prolong her life. It would have been a "surgical outrage" to have sewn up the patient and taken her instructions before removing the second ovary. From his experience, mischief in one ovary, even if cured, was followed by mischief in the other, and in his opinion incipient disease in the second pointed emphatically to its removal. On cross-examination he testified that in various cases of disease in the uterus it was necessary to remove both ovaries even if they were healthy.

From the foregoing evidence, the jury were of opinion that a tacit consent had been given and immediately found a verdict for the defendant.

It is matter for regret that the specific point, namely, whether a surgeon may disregard the express directions of his patient and pursue an operation beyond the limits fixed by him, was not decided, the case having gone off on the question as to whether the plaintiff had given a tacit consent to the operation as performed.

The question is one in which the public is deeply interested. For, if the patient, after being placed under the influence of an anesthetic on the operating table, may not have his previously expressed wishes regarded, but is liable, with returning consciousness, to find himself mutilated beyond anything that he had contemplated, the fear of such excessive operating may result in deterring patients from submitting to necessary operations. A strong popular feeling was aroused by the circumstances of this case; and the sincerity of the general sympathy with Dr. Cullingworth was proved by the fact that a popular subscription aggregating £1000, was taken to defray the expenses incurred by him in defending the action.

The lesson for the medical profession so impressively taught by the facts of this case is that before performing an operation the surgeon should be careful to explain what he proposes to do, together with the probable resulting consequences, and then secure the written consent of the patient himself to such operation as he may believe necessary; or, failing in this, a verbal consent, in unequivocal terms, in the presence of witnesses; or, if the patient be not in condition to give such consent, then from his nearest friends. In the absence of such consent, he should refuse to perform the operation.

BOOK REVIEWS.

ANOMALIES AND CURIOSITIES OF MEDICINE. An Encyclopedic Collection of Rare and Extraordinary Cases, and of the Most Striking Instances of Abnormality in All Branches of Medicine and Surgery, derived from an Exhaustive Research of Medical Literature from its Origin to the Present Day, Abstracted, Classified, Annotated, and Indexed. By George M. Gould, A.M., M.D., and Walter L. Pyle, A.M., M.D. Imperial Octavo, 968 pages, with 295 Illustrations in the Text, and 12 Half-tone and Colored Plates. Philadelphia: W. B. Saunders, 925 Walnut street. 1897. Prices: Cloth, $6.00 net; Half Morocco, $7.00 net. Sold only by Subscription.

We live in a world full of curiosities and anomalies, yet seldom realize how funny we are. Once in a while, to be sure, we drop into the show and see the bearded lady, the tattooed man, and the Circassian girl, but nature's real freaks and wonders escape us till enterprising men gather some of them together and write them up as Dr. Gould and Dr. Pyle have done. And most of the curiosi-

ties and anomalies in the world belong to the great science of medicine; the freaks cannot break out anywhere that is not still within her barbed wire fence; for medicine, like a polygamist, embraces pretty much everything; nature and the inanimate, science and art, physics and metaphysics, death and life. Like an Hibernian Octopus, it has an hundred arms reaching out for all discoveries, absorbing all investigators and making tributary to itself the ancient and modern; the rare find of the chemist, the realized dream of the electrician, the bones upturned by the pick of the archeologist, and the fossil fish which the geologist catches in remote and ancient rocks.

The "Anomalies and Curiosities of Medicine" is a big book. It deserves the name of "Encyclopedia." It covers the whole field with its broad pages and its complete index. Its bulk is mighty: broad, high, and thick. It takes its place as a volume of the new medical literature, requiring higher and wider shelves, and destined for the 20th century. Mighty volumes for mighty men—alas, how few are likely to survive till the mighty men read them; a decade will see them for the most part antiquated and neglected, but "Anomalies and Curiosities" will live, for it covers the field so completely that for twenty or forty years to come it will not pay to publish a rival; not till time has given the world a new crop of freaks and wonders. Centuries must pass before we again find 365 children at a birth (p. 147); many centuries before a new museum of monsters is collected, or before the physician extracts more strange and weird foreign bodies from unnatural locations; no, the work is too complete to fear a competitor, and will remain for many years a wellspring of information, reference, and recreation, and it is more than these. Its pages fairly fascinate the reader, like a thrilling modern novel. It is all plot, characters, and illustration. The weary specialist whose hands drop nerveless from incessant clutching of our country's "circulating medium" may sink into his easy chair "whose velvet violet lining" the "Electric" or "Welsbach" is "gloating o'er" and forget for a moment in its thrilling pages his load of care and wealth. The impecunious aspirant who sits behind his untarnished sign, faint from his last run to the pawnbrokers, or his last trot to an eleemosynary emergency case, can here bury his depressed spirits and rise transformed and nerved again for a new struggle with double monsters (p. 167); and while not exactly a book for the general public, it might prove an attraction on the physician's waiting-room table, and even build up for him a new anomaly and curiosity not mentioned in it in the shape of a self-made practice.

It is one of those books that like an effervescing alcoholic drink creates an appetite—a sort of "anomaly and curiosity habit"—for no sooner do we hear of something extraordinary, like a millionaire who does not found a university, or a trust that does not cheapen goods to the consumer, we ask at once, "Is it in the book," and turning there we find hundreds like our "rara avis," till the poor bird pecks its breast and dies, or, perhaps, sings a glucose song and gives it up, one more sad witness to the scope and value of "Anomalies and Curiosities of Medicine."

EDWARD WILLARD WATSON.

THE AMERICAN YEAR BOOK OF MEDICINE AND SURGERY, being a Yearly Digest of Scientific Progress and Authoritative Opinion in all Branches of Medicine and Surgery, Drawn from Journals, Monographs, and Text-Books, of the Leading American and Foreign Authors and Investigators. Collected and Arranged with Critical Editorial Comments by J. M. Baldy, M.D., Charles H. Burnett, M.D., Archibald Church, M.D., Arthur H. Cleveland, M.D., Colman W. Cutler, M.D., J. Chalmers DaCosta, M.D., W. A. Newman Dorland, M.D., Louis A. Duhring, M.D., Virgil P. Gibney, M.D., Homer

W. Gibney. M.D., Henry A. Griffin, M.D., John Guitéras, M.D., C. A. Hamann, M.D., Howard F. Hansell, M.D., Barton Cooke Hirst, M.D., E. Fletcher Ingals, M.D., W. W. Keen, M.D., Henry Leffmann, M.D., Henry G. Ohls, M.D., Hugh T. Patrick, M.D., William Pepper, M.D., Wendell Reber, M.D., David Riesman, M.D., Louis Starr, M.D., Alfred Stengel, M.D., G. N. Stewart, M.D., Thompson S. Westcott, M.D. Under the general editorial charge of George M. Gould, M.D. 8vo. Pp. 1257; cloth, $6.50; ½ morocco, $7.50. Philadelphia: W. B. Saunders, 1897.

After carefully examining the "Year-Book" of 1896 we have watched with interest for the 1897 number, because the appearance of a second number would indicate that the publication had been a success and would be continued. The well-known executive ability of the editor, Dr. Gould, is a criterion that the subject-matter consists of a review of the most important contributions to all departments of medicine and surgery. The beginning of each section contains a brief *résumé* of the year's work which has been prepared by the sub-editors of the different departments, which are of value. New proposals and investigations receive editorial comment, which is of use to the practitioner who might otherwise, perhaps, become perplexed by conflicting opinions. The section of general medicine, under the care of Doctors Pepper and Stengel, occupies 199 pages. Considerable space is devoted to Elsner's method for the diagnosis of typhoid fever; but we see nothing concerning Widal's serum diagnosis; probably, however, the latter was published at too late a date to be included in the review. The editors oppose themselves to those writers who have attacked the Brand method of cold bathing in typhoid fever. The treatment of tuberculosis by antitubercle-serum, receives considerable attention, as does also the treatment of erysipelas by antistreptoccic serum. The theories of Manson concerning the malarial organism are noted. Considerable attention is paid to dermatomyositis and its relation to rheumatism. There is a good *résumé* of the literature concerning the Nauheim or Schott treatment of heart disease. The editor has adopted the term "skiagraphy" as applying to photographs made by the Röntgen rays.

In the section on general surgery, edited by Doctors Keen and Da Costa, there is an abstract of Marmorek's work upon antistreptoccic serum. Several new amputations are described. Much space is given to Schleich's method of local anasthesia by infiltration. After describing the Clover inhaler for the administration of ether, the editors say: "We have never been persuaded that any one of the more complicated inhalers is equal to the device of Allis in safety or simplicity." Sheild's lectures on the diagnosis of carcinoma of the breast are abstracted at length. Much space is given to the literature on the surgery of the stomach, to that on the surgery of the appendix, and to that on the surgery of the intestine. Ten pages are devoted to a *résumé* of the literature concerning the Röntgen rays. Senn's article on first aid to the wounded is abstracted at length and there is a long abstract of a paper by MacCormac on some points of interest in connection with the surgery of war.

In the department of obstetrics, edited by Doctors Hirst and Dorland, the use of the Röntgen rays is also discussed, and there is an abstract of a paper by Dorland in which there is a new classification of puerperal sepsis. The use of antistreptoccic serum is merely touched upon.

The other departments are edited by competent and well-known workers in the different specialties.

The book is valuable and should be possessed by every one who professes to be in the vanguard of the army of scientific workers, and also by the general

practitioner whose ambitions lead him to add to the knowledge possessed at the time of his graduation. J. M. S.

High Altitudes for Consumptives. By A. Edgar Tussey, M. D. Philadelphia, P. Blakiston, Son & Co., 1896. 141 pp. 8°. Price $1.50.

This book undertakes to set forth the "principles or guides for a better selection or classification of consumptives amenable to high altitude treatment, and to the selection of the patients who may be more successfully treated in the environment to which they were accustomed previous to their illness." The peculiar and verbose style of the author is a disadvantage to the treatment of an important subject. We are led through a maze of quasi-philosophic discourse under various headings, such as Home Climate, Adjustment of the Vital Economy, Vital Capacity, Climatic Vicissitudes, Tangible Indices, Vulnerability, Blighted Hopes, Mournful Retrospect, etc. The book is evidently not intended for the general practitioner on whom the author bestows the following: "Family doctors (great blessings if skilful diagnosticians and realizing the limitations of the general practitioner) are such wonderful inventions that I sometimes wonder that the family does not have them patented. I presume that the expense is the main drawback. It is a pity, too, since it would be such a desirable consummation if some of the mistakes made by the ignorant and careless ones were limited to only one household." We think when quotations are made from the book of Proverbs and from the poet Whittier that changes in the language are inexcusable; so also with the index not the slightest alphabetical arrangement has been followed. The publishers have done their part very well. G. H.

Transactions of the American Climatological Association for 1896. Vol. XII.

Transactions of the American Laryngological Association for 1896.

These volumes of about three hundred pages each are a great credit to their respective societies. The work of the Climatological Association is represented by twenty-four papers, several of which have appeared in the columns of this magazine, and by a report on health resorts. The committee on health resorts has made two extensive reports and their secretary, Dr. E. O. Otis, of Boston, has arranged the information received as to various localities so as to give reliable data to guide physicians in making use of any of the resorts mentioned. Every precaution has been taken to give unbiased information. The committee also makes a report on mineral springs. The papers are devoted to the consideration of climate, and particularly the diseases of the circulatory and respiratory system.

The Transactions of the Laryngological Association is the largest volume thus far issued by that body. Thirty-nine papers are printed referring particularly to affections of the nose and throat. They constitute a valuable addition to laryngological literature, and if indexed would be of great value for reference. G. H.

The Year-Book of Treatment for 1897. A critical review for practitioners of Medicine and Surgery. Lea Bros. & Co., Philadelphia and New York, 1897.

The field has been allotted to twenty-six editors who have noted all the advances in treatment made during the past year in their several departments. This is the thirteenth issue of the publication and its value for ready reference is great. It is a handy volume, the subject-matter is well edited and arranged and once used will be always appreciated highly. G. H.

ITEMS OF INTEREST.

Shall Gratuitous Medical Services be Rendered Patients Occupying Private Rooms in Our Hospitals?

The Board of Trustees of one of our large hospitals in Philadelphia has followed the pernicious example set by the Roosevelt Hospital, of New York City, in suggesting that the Medical and Surgical Staff treat, free of charge, patients who pay $15 to $40 per week for private rooms. Among the many reasons which might be adduced against this mode of procedure, a lady visitor to the above-unnamed hospital advanced an idea which had not hitherto occurred to my mind. She said: "As you know, our family is in possession of a fair income. My son was ill not long since and we were obliged to seek the best medical skill that our city afforded. As the disease was a complicated one with a tendency towards chronicity, we paid out many hundreds of dollars for professional fees, besides additional money for nurses, medicine, etc. Now the point I desire to make is this: physicians must receive an adequate compensation for their services, and if they treat all patients free in our hospitals, they must necessarily make up the deficit by charging a correspondingly higher fee when they secure patients such as myself and my family, and we are therefore the real sufferers for the gratuitous services received by those who are perfectly able to pay a physician, but who prefer being treated in hospitals rather than in their own homes."

CATTELL.

The Widal-Gruenbaum Serum-Test at Post-Mortems and in Medico-Legal Cases.

We recently applied the serum test for the diagnosis of typhoid fever to the blood secured at an autopsy upon a child who died on the 18th day of the disease, and, as one would expect *a priori*, a typical agglutination and clumping of the typhoid bacilli were obtained. Even after a most careful autopsy, pathologists are sometimes perplexed as to whether or not they are dealing with typhoid, this being especially the case in septicemia, certain forms of poisoning, and in those cases where the ulcers are few or where they are situated chiefly or entirely in the large intestine. The point which the writer wishes to make, however, is the great importance that this test might assume, if it be pathognomonic, in medico-legal post-mortems. Let us suppose that a woman had had typhoid fever some months ago, that she was murdered, and that some blood-stains were found on the clothes of her husband, a butcher. The defense claimed that the blood was that of an ox. Up to this time the expert has only been justified in stating that the blood was consistent with human blood. But, if our premises are correct that this reaction was ob-

tained from the blood-spots, that it is pathognomonic of typhoid fever and that the ox is not affected with typhoid fever, would it not be positive proof that the blood was not that of an ox? If this same mode of reasoning could be carried out with the other lower animals—none of which have typhoid fever unless produced experimentally—could we not state definitely under certain conditions that the blood was human blood?

CATTELL.

Beer Bottles as Receptacles for Urine.

A circular letter has been received asking for the coöperation of physicians in the suppression of the use of beer bottles as receptacles of urine for purposes of future examination. One would infer from this circular that the examination of urine was a much commoner routine practice among physicians than it is, and that the beer bottle was selected as being the most convenient vessel for carrying urine to the doctor's office. Our practice has always been to add concentrated nitric acid to, and then to destroy, all bottles that have contained urine, sputum, etc., so that they might not be used again. The main objection, however, as suggested by Dr. Leffman, to the employment of beer bottles, is the fact that some of the fermentation fungi may still remain therein, and that the urine, especially if from a diabetic patient, besides showing the presence of the foreign body, will undergo decomposition more readily than is ordinarily the case. The advantages to be derived from "firing" the bottles previous to use are not generally known. This is accomplished as follows: First cleanse the bottle, dry, and introduce therein a small quantity of pure alcohol. Ignite the alcohol, and allow it to exhaust itself by burning. The glass stopper, if there be one, is similarly treated. It is often surprising to notice the length of time that passes before decomposition of urine sets in when the bottle is prepared by this method.

CATTELL.

NOTE TO CONTRIBUTORS.

AUTHORS will receive liberal compensation for all accepted articles after publication; or 250 reprints, if asked for on the manuscript, will be furnished in lieu of the honorarium. It is distinctly understood that all articles appearing as original matter are for our exclusive use, and are not to be reprinted or to appear in any other publication excepting the Transactions of the Society before which the paper may have been read. Illustrated papers are especially desired.

All matters of business, as well as subscriptions, should be sent to the INTERNATIONAL MEDICAL MAGAZINE COMPANY, 3709 Spruce Street, Philadelphia.

Manuscripts, exchanges, and books for review should be addressed to the Editorial Office, 3709 Spruce Street, Philadelphia.

INTERNATIONAL
MEDICAL MAGAZINE.

Vol. VI.] MAY, 1897. [No. 4.

ORIGINAL COMMUNICATIONS.

"Quidquid latet, adparebit,
Nil occultum remanebit."

THE RÖNTGEN RAYS IN SURGERY.[1]

BY CARL BECK, M.D.,

Professor of Surgery, New York School of Clinical Medicine, Visiting Surgeon to St. Mark's Hospital, German Poliklinik, West Side German Dispensary; Consulting Surgeon H. S. G. S. Orphan Asylum; Honorary President Section of General Surgery, Second Pan-American Congress, Etc.

FEW scientific discoveries of the century have astonished the world more than that recently reported by Professor Wilhelm Conrad Röntgen, of Würzburg. The significance of this great discovery cannot even yet be estimated. It shows men the prophetic correctness of Hamlet's saying that there "are more things in heaven and earth than are dreamed of in our philosophy."

The preparatory researches which have led at last to this discovery date from the time when Maxwell, extending and applying Faraday's theories, found that the phenomena of electricity depend upon the same principles as those of light. Both consist in vibrations of the ether that fills the whole universe. Wiedemann, Verdet, Kundt, and Röntgen tried to prove that the phenomena of electricity are in close connection with those of light, and that not only could electricity produce light, but also that light could produce electricity.

The correctness of these theories, however, could not be proved until the experiments of Wilhelm Hertz, the gifted Professor of the University of Bonn, brought conviction to the minds of even the most skeptical. Hertz showed that electric induction obeys exactly the same laws as those governing the diffusion of the light waves. He also determined the speed of transmission of the electric wave, which he found to be equal to that of light.

[1] Paper read before the Surgical Section of the Second Pan-American Congress, City of Mexico, November 9th, 1896.

The phenomena of electric discharge in closed tubes of various exhaustion and filled with different gases had also been the subject of physical experiment for many years, and a marked difference was noticed between the phenomena of light at the two electric poles. Light radiating from the positive pole extends entirely through a vacuum tube; while light radiating from the negative pole produces only a very weak and diffused illumination. But as soon as the vacuum is increased to a high degree, the phenomena becomes entirely different. The light of the positive pole decreases, while that of the negative pole pervades the vacuum more and more, being permanently propagated in straight lines.

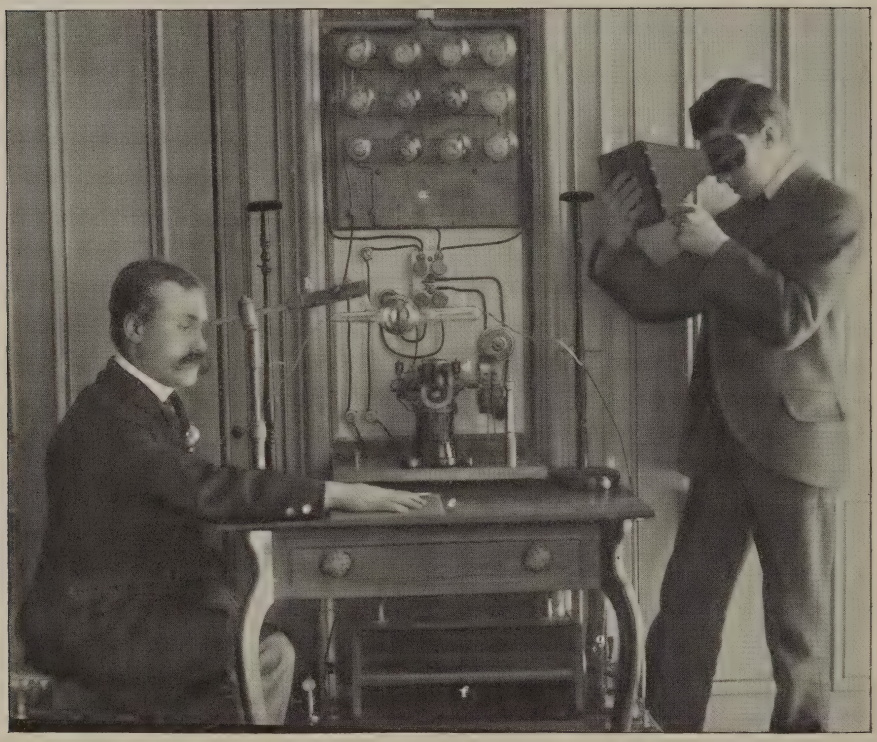


FIG. 1.—X-ray apparatus in use in writer's private office; the amount of space required being reduced to the minimum. For description of the apparatus, see page 247.

The light emanating from the negative pole is called the "cathode ray." Lenard and Hittorf found that these rays have the power of creating fluorescence, heat, etc., and that they can be deflected by a magnet. The vacuum tube that is commonly used is called a Crookes' tube. It consists of a pear-shaped glass vessel, exhausted of air, into which the ends of an electric conducting wire, the electrodes, are fused.

The rarifaction of the air in a tube of this kind can be brought as high as one millionth part of the ordinary density. These tubes, however,

should properly be called Geissler tubes, because they were invented and first manufactured by Geissler, the ingenious mechanician of Bonn, Crookes having only described and slightly modified them. As soon as an electric current of high intensity goes through the conducting wires, the negative electrode, the cathode, becomes surrounded by a faint dark blue light, while the positive electrode, the anode, sends a peach-colored light through the tube as far as the light of the cathode. As the air is gradually rarified, the positive stream of light almost entirely disappears, while the blue negative cathode light extends more and more, and finally fills the whole tube.

In December, 1895, Röntgen, while experimenting with these tubes by

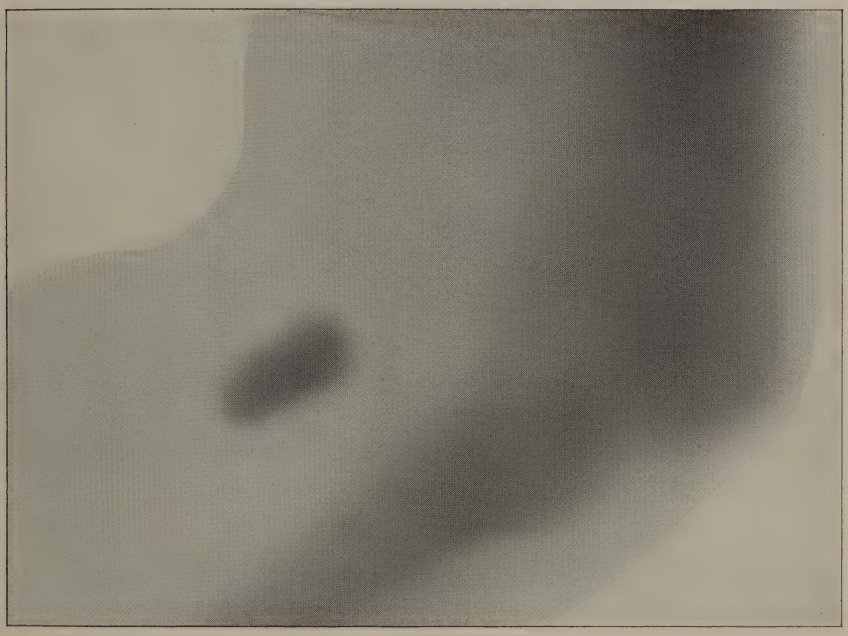


FIG. 2.—Bullet *in situ* above elbow. (First Röntgen picture of a medical case taken in New York City. Duration of exposure, one and a-half hours. Operator, Prof. Pupin. Patient of the writer.)

surrounding them with black, impermeable paste-board, discovered an astonishing phenomenon. On a screen standing near the tube and painted with a light color (platino barium-cyanide) he noticed a light as soon as an electric current went through the tube. It became evident at once that here was a radiant power, which, although not perceptible to the eye, permeated the paste-board. This force, heretofore unknown, also showed a marked effect on the screen. Röntgen, after having found that the effect of these invisible rays upon the screen was constant, tried photographic experiments also. He then discovered that under the influence of these rays his hand, resting upon the cover of a wooden box, gave a sharp silhouette on a dry-

ing plate below, although the cover was not removed; and also that paper, wood, and even thin disks of metal, were permeable by the rays, while thick disks of metal, bones, etc., produced silhouettes. This latter discovery, in

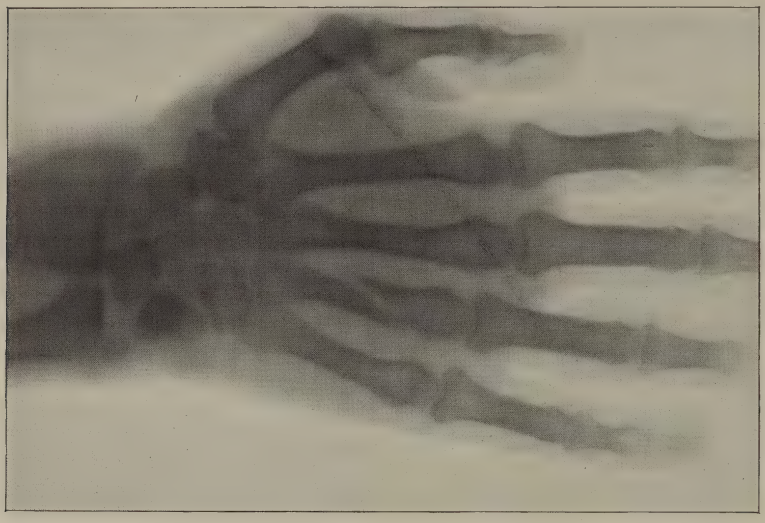


FIG. 3.—Fracture of the fourth metacarpal bone.

particular, at once aroused the most widespread interest of surgery; and up to the present date its full significance can hardly be appreciated. Röntgen, in his extreme modesty, suggested naming the new rays X-rays, until their nature should be discovered; but the eminent Professor Köl-liker, of Würzburg, very properly proposed calling them "Röntgen rays," and the veteran scientist's recommendation will probably be sustained by men of science and by the profession.

It is needless to say that in this country the new discovery was greeted with the most intense interest. In physics, men like Pupin, Tesla, Rood, and Mayer; in surgery, Drs. W. F. Magie, H. P. Morton, W. W. Keen, H. W. Cattell, E. P. Davis, J. Burry, and J. W. White, besides myself, have made the first practical experiments in America. I was the first surgeon in this city, as far as my knowledge goes, who, through the kindness of Professor Pupin, of Columbia College, was enabled to avail himself of the practical advantages of the Röntgen rays. (See cases below.)

To produce the Röntgen rays there are required an electrical current, a Ruhmkorff coil, and a vacuum-tube. If there is not a city supply, which, however, should be used only after introducing a shunt, an accumulator should be employed. Voltaic cells or a storage battery may be used for the purpose. I have used the static machine, the Edison-Laland cells, and the storage batteries. After having met with many disappointments, I secured connection with the street-current (Edison Electric Illuminating

Co.), and it is only since then that my experimental work has been a real source of pleasure to me. The stronger the apparatus is, the more efficacious the rays will prove as a rule. The apparatus should give a spark at least twenty centimetres (eight inches) long, and the strength of the current should be about ten ampères.

Good vacuum-tubes are still hard to obtain, and very expensive, this deplorable circumstance being the greatest obstacle to the thorough introduction of the method in general practice. Upon the reliability and the high vacuum of the tube, the efficiency of the experiments is largely dependent.

One of the great difficulties encountered in the use of these tubes is due to their soon becoming inefficient on account of the permanent changes of pressure which occur within them. Siemens, the great Berlin electrician, has recently constructed a tube which permits of intensifying and diminishing the vacuum at will. It is found that the fluorescing air, with the vapors of phosphorus, iodine, and similar substances, form dense bodies, thereby diminishing the pressure within the tube. On the other

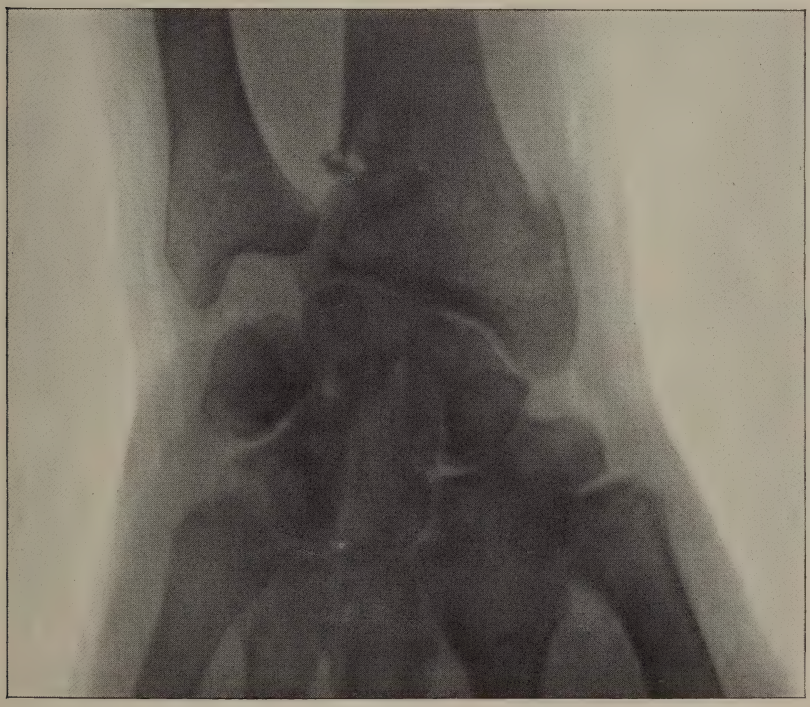


FIG. 4.—Colles' fracture. Accident three hours ago, slight infraction of the ulna.

hand, if the walls of the tube are warmed, the stratum of air which condenses on the glass surface, is driven away, thereby intensifying the pressure. A cylindrical discharging tube contains an aluminum-cathode

of the shape of a concave mirror, and a plane platinum anode, set obliquely to the axis of the tube. To a glass globe, connected with the discharging tube, another anode is attached, opposite to which a small tube is adjoined. The walls of the tube are covered with phosphorus for the purpose of absorbing the air. With the aid of the fluoroscope it can be ascertained at once whether or not the amount of pressure present in the discharging tube produces efficient rays. If there is but little fluorescence in the fluoroscope, while an intense conic garb of the rays originates from the concave mirror, the air-pressure is too high. In this case the positive pole is attached to the electrode of the glass globe, the current affecting the air and the vapor of the phosphorus until the white blue light in the connection tube shrinks together to a thin thread. On the other hand, if there is no blue light at all, the fluoroscope showing

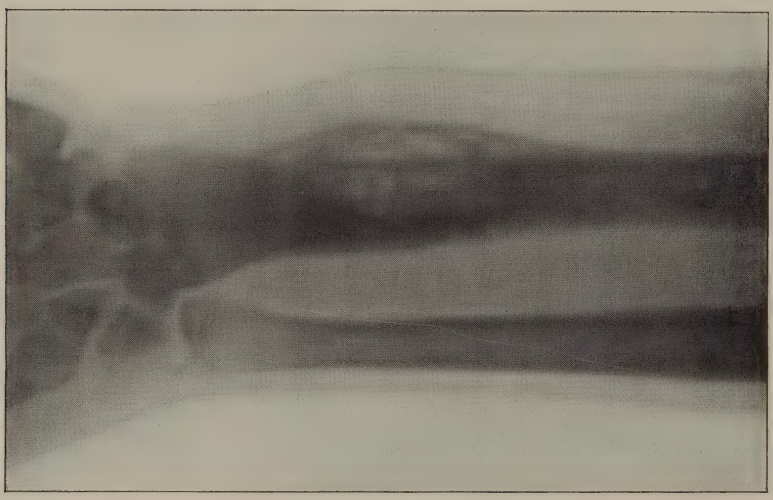


FIG. 5.—Colles' fracture. 24 days after the accident, the deformity being increased by extensive callus formation.

hardly any fluorescence, the air pressure is too low. Then the pressure is intensified by heating the globe with an alcohol lamp, thereby driving the air stratum adhering to the glass into the vacuum. It is a great advantage of this new tube, that good reproductions can be obtained by it even with small spark inductors.

Röntgen pictures are variously called X-ray photographs, shadowgraphs, radiographs, cathode photographs, cathography, electro-photographs, flurographs, skiagraphs, skotographs, and Röntographs. They are best taken in a spacious room, which can be illuminated and darkened rapidly. The requisites are a source of current, a Ruhmkorff coil, a number of vacuum-tubes, an alcohol lamp, a tube-stand, a fluroscope, and photographic plates. A photographic outfit is also desirable.

Fig. 1 illustrates the method of taking a picture. The current is obtained by connecting with the attachment, in the wall of the surgeon's office. From there it passes through the Ruhmkorff coil, *f*, and goes through the make and break wheel, *d*, which, by reason of the rapidity of its revolutions, produces a continuous fluorescence and is far preferable to the vibrator commonly used if the electric supply comes from ordinary batteries. The motor which operates the wheel can be regulated and adjusted to two speeds. From there the current, after having passed the lamps of the shunt board, *a*, reaches the vacuum tube, *i*. The shunt board containing twelve lamps permits of the reduction to the required voltage. Upon the proper action of the Ruhmkorff coil, principally

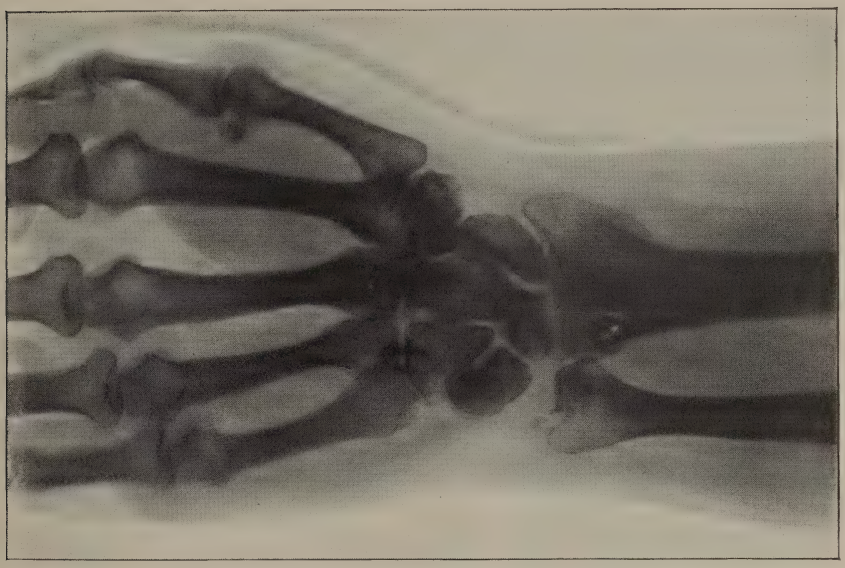


Fig. 6.—Colles' fracture. Accident five weeks ago.

upon the insulation of the most vital part of the coil, the secondary windings, the satisfactory fluorescence of the vacuum tube depends. The tube must be held by the tube-stand, *h*, so that it can be adjusted to any position required. It is also advisable to have two other stands (hat-stands answer the purpose well) for attaching the wires properly.

The different levers are turned in the following succession: First, the main lever on the wall; second, the button on the make and break wheel, and third, the switch of the Ruhmkorff coil is turned. Disobedience to this rule is apt to burn out the coil. After the tube is regulated as described, the apparatus is ready for the use of the fluoroscope or of the photographic plate.

The fluoroscope, *b*, consists of a tapering box, which is curved at one

end so that it fits over the forehead and eyes like a stereoscope. Its end is closed by a cover made of paste-board, on the inside of which a layer of tungstate of calcium or barium-platino-cyanide is spread. An object placed between the tube and the fluoroscope forms a shadow on the board, by which it can be thoroughly studied. Information is occasionally thus

FIG. 7.—Colles' fracture and fracture of the slyloid process of the ulna. An enormous amount of callus has been thrown out preventing pronation and supination.

obtained in a second such as heretofore could not be got after hours of exhausting examinations. I shall only refer to the case described below, where I could at once see the penny in the esophagus of a child.

If a skiagraph is wanted, the object is placed on top of a sensitized plate, *e*, wrapped in black paper. The tube should be brought near to the object; the nearer the tube the more efficient the light, but if brought too near the shadow might diverge. The average distance should be about six inches. The exposure takes from a few seconds to a number of minutes, according to the permeability of the object and the excellence of the tube. Good skiagrams of the hand can be obtained after one minute's exposure, while the trunk required until recently from thirty to forty-five minutes. These are all points which are to be determined by experimentation and a vast amount of experience. When the exposure is finished, the levers are turned back in the same succession as indicated above. Then the plates are labeled and put into a dark place until they are developed. The developments are done in the usual way, the very simple directions being obtained with the plates when purchased.

Recently, in the laboratories of Siemens and Halske, of Berlin, it was found that by using spark-inductors, the spark-length being about two inches, an ordinary incandescent lamp can be used, provided the primary current be changed.

So far no science has derived so much benefit from the Röntgen discovery as has surgery. As said above, the thicker the objects are, the less permeable they become. Wood, paper, dressing-material, etc., are transparent to the rays, while the metals, like steel, lead, tin, etc., are only to a small extent permeable.

The different organic substances of the body are more or less transparent to the rays, while inorganic substances, like the salts of lime of the bones, are but slightly permeable.

The organic tissues of the human body show permeability of a medium degree. The muscular layer of the heart, or of a hand or foot of ordinary size, is about the same as that of a liver and kidney of the same thickness. The tissues of the nerves and of the blood-vessels are a little less permeable.

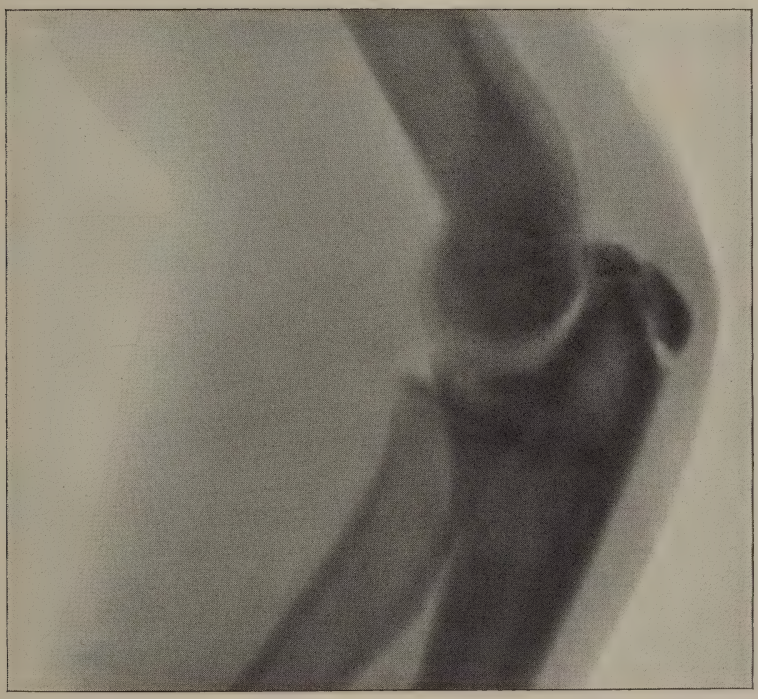


FIG. 8.—Fracture of the olecranon.

This explains why in Röntgen pictures of the soft parts no particular variety of tissue, as of muscle, tendon, ligaments, nerves or vessels, is usually conspicuous. When one or another tissue is especially more visible, this must be attributed to the greater thickness of the mass of the

tissue in question, and not to its own character. About the same degree of permeability is shown by hyaline cartilage and by normal, as well as decomposed, blood. Bone-tissue, as stated above, is very slightly permeable; the more lime-salt the bone contains the less permeable it is. Compact bone-tissue thus shows a much more distinct picture than the medullary or spongy parts.

The impermeability of the metals enables us to recognize even small particles through the thickest tissues. The fact that the different metals possess a greater or lesser degree of compactness can also be utilized for differentiation. Aluminum can be rolled out into plates of such thinness that it becomes permeable to the rays, so that for covers or receptacles for fluids, it can be used instead of glass, which is less translucent to the rays in question.

In taking *pictures of the extremities* the position deserves attention. The forearm is best photographed in supination, although this position is by no means the most comfortable one for the patient. The upper arm and the thigh can be taken in any position. The lower leg should be photographed while its external surface rests on its support, the knee being bent and the thigh rotated. The foot is best photographed in the direction of the dorsum towards the planta pedis from the toes up to the upper third of the metatarsus. Further backwards the first and third cuneiform bones and the scaphoid present an obstacle, so that it is advisable to illuminate the foot on these portions transversely by having the outer surface rest on the support. By this procedure, the isolated shadows of the astragalus, the calcaneus, the os cuboideum, the scaphoid, and the fourth and fifth metatarsal bones, can be seen. The hand is taken from the dorsum to the palm. The knee-joint rests best on the external condyle. The humero-ulnar joint is preferably taken transversely while the humero-radial joint should be illuminated from the flexor to the extensor side.

Errors, however, may easily be caused by shadows, produced by thick portions of bone. This shows the importance of being thoroughly acquainted with the anatomical relations of the bones which produce the doubtful shadow. The question then would be, whether it is normal or not, as on such portions the muscles and tendons would cause obscurer shadows. The carpus is especially apt to produce such errors; the tuberositas oss. multangul, the majus of the scaphoid, the hamulus oss. hamati, the os pisiforme, and the eminentiæ carpi volaris radialis and ulnaris doubling up the thickness of the carpus, thereby causing darker shadows, which might be mistaken for foreign bodies. Similar procedures and similar cautions apply to the other diagnostic opportunities offered by the new rays. In general, it may be stated that no difficulty arises in skiagraphing splinters of metal or glass, bullets, needles, etc.

Fig. 2 illustrates the first skiagram taken in this city. (Demonstrated before the Eastern Medical Society of New York, March 6, 1896, and be-

fore the Society of the Physicians of the German Poliklinik, March 29th, 1896.) It shows skiagraphy in its infancy. Although the exposure lasted fully one and one-half hours, humerus as well as radius and ulna are not distinct. The soft tissues can hardly be recognized, but the bullet is well marked.

The patient, a man 24 years of age, admitted to the surgical department of St. Mark's Hospital, reported that while cleaning a revolver it accidently exploded and a bullet entered his forearm. On examination a bullet wound was found on the flexor side, above the median surface of the radius and three inches below the capitulum radii. As the usual diagnostic methods did not reveal anything in regard to the position of the bullet, an incision, reaching from one inch above the capitulum radii downwards to the ligamentum interosseum, was made under anesthesia.

FIG. 9.—Vicious union of fracture of femur. 9 weeks after the accident.

On the inner surface of the ulna a splinter of bone was found loosely attached to the ulna, and was removed. At this point there was a depression like the opening of a shot-canal, so that it seemed to me that the missile had entered the ulna and was imbedded there. The wound was closed again. I was not satisfied, however, and concluded to consult the rays which had just begun their triumphal march through the world. On February 21st, Professor Pupin, of Columbia College, had the kindness to expose the arm to the rays for one and a-half hours. A very good photograph showing the elbow, the radius, and the ulna was obtained, but no missile was discovered. After repeated unsuccessful efforts, a photograph of the humerus was taken, and here the bullet was found imbedded in the soft tissues. It can be understood that I did not think of searching for the missile so far up, the less, as the splinter and the depression, as de-

scribed above, pointed to a different locality. In this case the rays revealed most accurately what the exploratory incision could not determine.

Another interesting case demonstrated before the Eastern Medical Society of New York, March 6th, 1896, and before the society of the German Poliklinik of New York, March 20th, 1896, also by the kindness of Professor Pupin. A man, 27 years of age, whose hand was penetrated three years ago, by twenty-nine buck-shot. The patient does not suffer

FIG. 10.—Partial resection of left ankle. Partial removal of right second, third, fourth, and fifth metatarsi and of the os cuboideum.

much inconvenience from them so far, and as long as the shots are quiescent his condition is merely an interesting phenomenon; but if there should be any disturbance the extraction of the foreign bodies would be materially aided by the all-revealing rays.

I had a chance to examine the following case, through the kindness of Dr. Rindfleisch, of Professor von Bergmanns' Clinic, and of Dr. Stechow, of the Army Hospital, at Berlin. It concerns a man, 46 years of age, who was struck by a bullet during the Franco-German War (1870). Unfortunately, the original skiagraph is so large that it would be spoilt by the reduction necessary to permit of its use in illustrating this article. The

missile entered the left supra-clavicular region, while the patient, who was just aiming his gun, lay on his abdomen. He recovered quickly. During the last few years he has counted about 4,000 attacks of hemorrhage. According to his own statement he has always felt distinctly that the hemorrhage originated from his right lung.

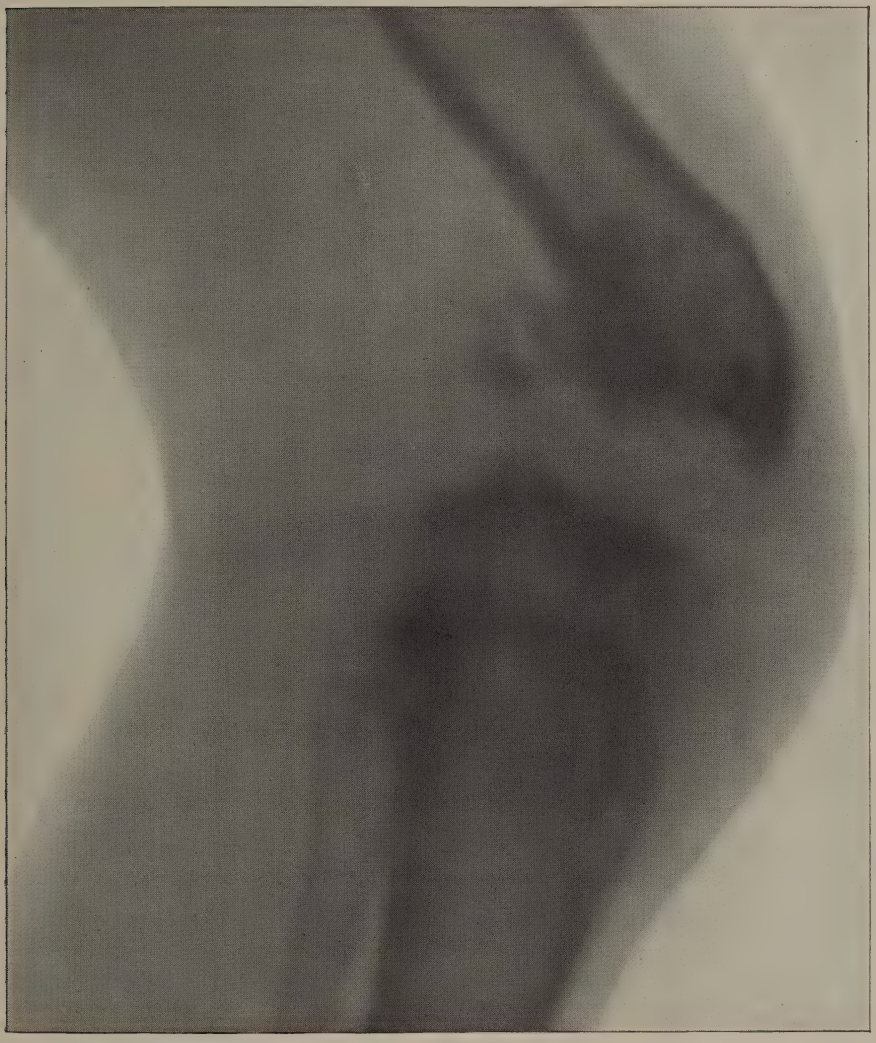


FIG. 11.—Resection of knee-joint for tuberculosis.

The appearance of the thorax does not furnish any information as to the manner in which the bullet reached the right side from the left, the scar being on the left inner scapular angle, perfectly movable. No subcutaneous cicatrical bands can be felt. Neither was there any disturbance within

the upper extremities or of the spinal column. The skiagram was taken from behind, August 24th, 1896, and the exposure lasted two hours. The shadow of the heart is visible on the left. The right-seventh rib shows a slight infraction with an upward angle, and is very much thickened. In the fifth intercostal space a distinct round-shaped shadow is noticeable, which is apparently due to the missile. The slight shadow which can be noted further downwards and outwards seems to be caused by the rib cartilages, crossing the ribs posteriorly. Professor von Bergmann, to whom the case was referred for operation, did not give a definite opinion at the time of my presence at Berlin, as to whether or not he would risk an operation.

Fig. 12.—Osteo-sarcoma of right radius.

It is also easy to produce topographic-anatomical representations of the skeleton. Deficiencies of bones, deformities, fractures, dislocations, callus-formations, complications of fractures, and dislocations are also representable.

Fig. 3 represents a fracture of the fourth metacarpus. Crepitus not having been present and the swelling extending over the whole hand, the diagnosis of the true character of the injury was not made before the rays were consulted.

Figs. 4, 5, 6, and 7 show a series of cases of Colles' fracture in different stages each illustration representing a different patient. The skiagraphs have been reduced not quite one-half. Suspected "green stick" fractures can also be easily diagnosed.

Fig. 8 represents a fracture of the olecranon, which, as neither crepitus

nor mobility of the fragment could be detected, was not diagnosed until the rays gave the information of the existence of a fracture.

Fig. 9 shows a case of vicious union of fracture of femur, which was treated by wiring the fragments. In this case the union became perfect after operation.

Fig. 10 shows partial resection of left ankle-joint, and partial removal of second, third, fourth, and fifth metatarsus, and of the os cuboideum for

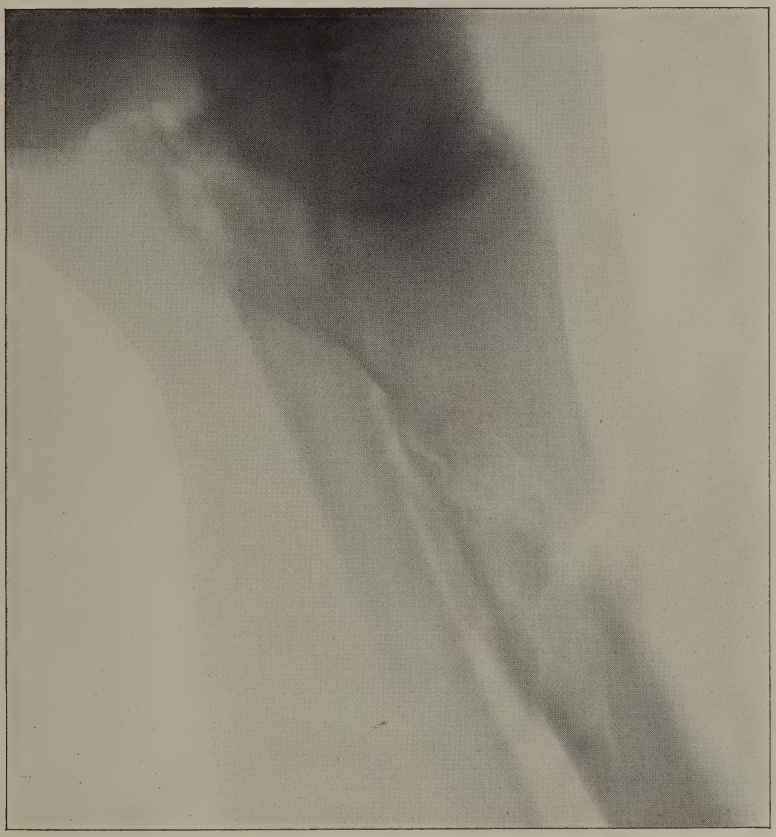


FIG. 13.—Compound fracture of the tibia, caused by the new army bullet. Shot from 50 yards, at Governor's Island, New York.

tuberculosis. The skiagram shows the repairing proliferation of bone-tissue, the fifth and fourth metatarsal bones growing together.

Fig. 11 represents resection of knee-joint for tuberculosis in a boy ten years of age. The result was very good in this case, limited motion being possible. The skiagram shows the absence of bony ankylosis and the abundance of new bone-tissue around the resected area of the femur.

Fig. 12 shows an osteosarcoma of right radius in a woman aged 40.

Fig. 13 shows the splintering produced by the new army bullet. It

shows distinctly that it is an error to assume that the thinness and the great force of the bullet would cause a clean, round, canal-like foramen. The reader interested in this subject is referred to Captain LaGarde's article in the March, 1894, number of the INTERNATIONAL MEDICAL MAGAZINE.

The manner in which a fracture is treated may also be demonstrated by reproducing the limb together with the bandages, etc. The Röntgen picture is thus a document, illustrating the treatment by the surgeon in charge; a record which might prove to be of great value in a medico-legal way.

Neusser has proved that phosphates as well as other urinary calculi can be well shown by the rays; the great obstacle in the diagnosis being that their receptacle, the bladder, is situated in the pelvis, the bony structures of which prevent the permeation of the rays. Recently, indeed, it has been claimed that renal calculi could be recognized but this is so far not sufficiently corroborated. Gall-stones, unfortunately, are permeable to the rays, so that only a very indistinct shadow is obtained. But Neusser, Goodspeed, and Cattell (*Med. News*, February 15, 1896), claim that they can diagnosticate the presence of these by this method. In two cases, in which the presence of gall-stones was diagnosed, I was not able to demonstrate the stones on the skiagram with any degree of reliability, but I have no doubt that the future will give us better means of recognition in the way of improved tubes.

In thoracic surgery I have been able to get excellent reproductions of the ribs, which enable us to prove that after subperiosteal resection of a rib the exsected portion is always more or less reformed. I could furthermore illustrate after I had performed extensive resection for old pyothorax, to what extent the ribs were removed, which is of interest for future comparison. (See writer's article on "Pyothorax," INTERNATIONAL MEDICAL MAGAZINE for January, 1897.)

In regard to the recognition of foreign bodies, the following case may deserve mentioning as being of great interest.

On January 17th, a year old baby was brought to my clinic. The history revealed that nine days since, the baby had swallowed a penny. When examined at the hospital of this city it was pronounced that the foreign body had passed the esophagus. The mother watched the feces of the patient carefully, but did not find the penny. In the meanwhile the baby became feverish and vomited frequently. At the time I saw the child, I had the impression that a grave disease was present. Instead of introducing an esophageal probe, as I used to do in former years in such cases, I availed myself of the fluoroscope, which located the penny at once on a level with the second rib. I now introduced a coin-catcher. After having passed the isthmus I felt a resistance. I pushed the instrument forward, turned and withdrew. There was considerable resistance which I tried to overcome, but while pulling, the steel-attachment of the coin-catcher broke, so that coin and catcher were both caught in the esophagus. After many

unsuccessful efforts I could at last extract the broken fragment with an esophageal forceps. I now tried to propel the coin towards the stomach with a whale-bone pusher. No sooner had I succeeded with this effort, then the child vomited and the penny was ejected.

There is no doubt that the Röntgen rays have started a new era in the location of foreign bodies in the esophagus, so that they will no longer remain unnoticed, and are no longer confounded with phthisis pulmonum, croup, bronchitis, asthma, etc. (See writer's article "On Foreign Bodies in the Esophagus," *Clinical Recorder*, July, 1896.) How often has it happened to me that I made an unnecessary exploratory incision into the hand of a poor seamstress, who reported that some time ago a needle had entered her palm and while she had extracted a piece of the broken needle she was not sure whether there were two fragments or only one. The hand still being swollen, the question was whether the inflammation was due to traumatic irritation or infection, or to the presence of a foreign body.

Regarding the recognition of changes in the soft tissues, it must be stated that calcareous areas in tuberculous lungs can be well represented, while dark points in case of arteriosclerosis must be judged *cum grano salis*. The organs, which are kept moving by the respiratory act, particularly the diaphragm and the liver, cannot be photographed, but very distinctly observed while in motion, with the fluoroscope. The same applies to the heart and parts of the pericardium.

Effusions, whether serous or purulent, cannot be recognized directly, but by finding a translucent space between diaphragm and liver, for instance, a subphrenic abscess could be expected. (See writer's article, "Beitrag zur Literatur der subphrenischen Abscesse," *Langenbeck's Archiv*, Vol. LII, No. 3.)

It must be added that with the fluoroscope the motions of the bones at their joints, the larynx, the hyoid bone, etc., can be studied.

It had been hoped that the Röntgen rays would prove to have a directly curative effect in zymotic diseases. But the vitality of bacteria, of pathogenic bacteria, at least, is not impaired by the rays even under exposures lasting more than an hour.

Lately cases of extensive dermititis, caused by the rays, have been reported. Although having made more than three hundred skiagrams since February, 1896, and knowing of many others, I have never observed any ill effect that could be traced to the rays. I once exposed myself to the rays for more than five successive hours, and did not note the slightest reaction. The possibility of originating skin diseases seems to be extremely small, particularly since the time of exposure is so very much shorter than during the earlier stages of the art.

To sum up, it can readily be seen up to the present that the new method displays its greatest prerogative in *the recognition of foreign bodies*. In future the probing of wounds which has done such an immense amount

of mischief, will no longer be necessary. It is to be hoped that not only hospitals, but every practitioner will be able to buy the apparatus, with the latest improvements, which will enable him to use the ideal "Röntgen probe." We are justified in expecting that the near future will bring us still more elaborate and beneficial applications of this mysterious light. What an immense benefit would it be, if, where our limited means of palpation cease, as in the great cavities of the body, the rays would inform us of physical conditions hitherto concealed.

In conclusion, I desire to express my sincere thanks to Professor Röntgen for the great courtesies shown to me recently at his laboratory in Würzburg. I also thank Dr. Rindfleisch, of Professor von Bergmann's clinic; Dr. Stechow, Oberstabsarzt at the Army Hospital in Berlin, and to Professor Pupin, of Columbia University.

ANEURISM OF THE RIGHT POSTERIOR AORTIC SINUS OF VALSALVA, WITH RUPTURE.

BY HENRY W. CATTELL A.M., M.D.,

Demonstrator of Morbid Anatomy in the University of Pennsylvania; Senior Coroner's Physician of Philadelphia, etc.

AND

J. DUTTON STEELE, M.D.,

Associate in the Pepper Clinical Laboratory; Assistant Demonstrator of Morbid Anatomy in the University of Pennsylvania; Pathologist to the West Philadelphia Hospital for Women.

ANEURISM of one of the sinuses of Valsalva is a very rare pathological lesion as indicated by the scant references to this condition in medical literature and by the fact that this is the first case of the kind which one of us has seen in some 2,000 autopsies.

Our case is that of a well developed colored man who was found dead October 9, 1896, his age being about 45 years. On the frenum of penis is a healed scar, probably of syphilitic origin. The abdominal cavity contains about two quarts of clear fluid. The peritoneal covering of the intestines is normal. The liver barely reaches to the costal margin in the mid-clavicular line. There is considerable perihepatitis. The omentum is shortened and thickened, and there appears to be a fibrous change in it. It is rolled up and contracted, and tightly adherent to the transverse colon, and forms a mass 5 cm. in vertical and 4 cm. in antero-posterior diameter. The parietal peritoneum is thickened, white, and glistening. Mesenteric glands are somewhat enlarged. Appendix is free, but shorter than normal. The left pleural cavity is half full of clear yellow fluid, evidently transuditic; no fibrin in it. No evidence of an inflammatory process. Right pleura is about one-third full of a similar fluid. No adhesion in either pleura. Pericardium contains about 100 c.c. of clear fluid. Several milk spots are seen in the pericardium on the anterior surface of heart. Heart is dilated and relaxed, and left ventricle is full of liquid blood. The auricles and

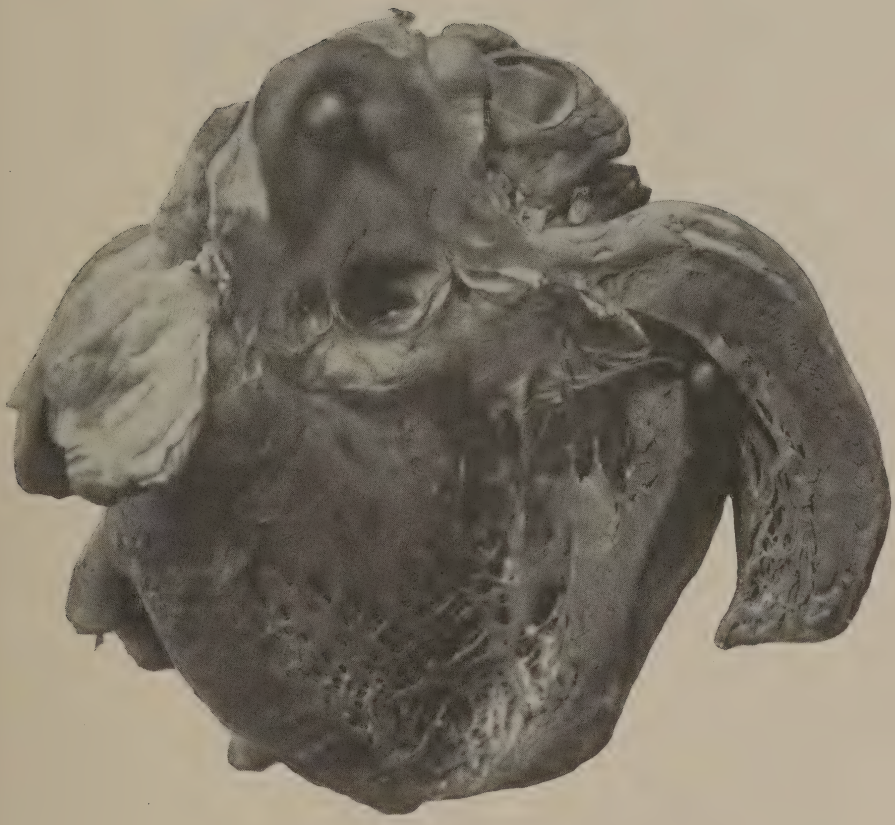


FIG. 1.—Dilation and bulging of the right aortic sinus of Valsalva are seen, the coronary artery on the left side comes off above, and on the right side, below the free margin of the valve. The aorta and mitral valves are smooth, while some fibrous change is noticed in the tips of the papillary muscles. (Reduced one-third.)

FIG. 2.—The aneurismal bulging of the left auricular wall is seen presenting in the tricuspid orifice, the leaflets of the tricuspid valve having been separated and therefore appear distorted. The probe passes from the right aortic sinus through the point of rupture in the aneurism. It would therefore discharge blood into the right ventricle even if there had been complete closure of the valve as the pulmonary cusp of the tricuspid at its side is composed of chordæ tendinæ. (The photograph has been taken from above looking down upon and through the tricuspid orifice; the pulmonary artery is at the top and to the left. Reduced one-third.)

left ventricle contain firm white clots. The coronary arteries are tortuous and show many plates of fibroid change. The heart is much hypertrophied, and weighs 20 ounces (566 grammes). The muscle is friable, and there is some evidence of fatty and fibroid changes in the papillary muscles ; the mitral valves are slightly thickened and opaque. The aortic valves show several spots of commencing fibroid change ; the valves of the right side are normal. There is an aneurism of the right posterior sinus of Valsalva (the one in which there is no coronary artery). This aneurism admits two fingers ; the sinus is dilated and affects this sinus alone, the other two aortic leaflets not being disturbed. The aneurism extends downwards and backwards to the right and pouches into the right auricle. It has dissected up the endocardium of the auricle, and has dissected loose the attachment of the posterior tricuspid leaflet and the end covering the auricular ventricular ring. The posterior lining of the aneurism is formed by the dilated wall of the aorta, which has undergone much fibroid change, and in several places shows calcareous plates. The apex of the aneurism just above the attachment of the posterior tricuspid leaflet shows a small opening just admitting a small probe, leading from the aneurismal sac into the right ventricle. The opening is surrounded by a ring of soft, newly-formed granulation tissue. The aneurismal pouch measures, in width, 4 cm. antero-posterior diameter, 3.7 cm.; the hole is 12 mm. from the free edge of the tricuspid valve. Circumference ; median 8.5, shut 6 cm.; depth 3 cm. The left ventricle is 20 mm. thick; left auricle is 5 mm. thick ; right ventricle is 10 mm. thick ; right auricle is 4 mm. thick.

Spleen: Capsule is much thickened, opaque, and white. There is considerable perisplenitis binding the organ to the abdominal wall and to the transverse colon. There are no scars upon the organ: 8.5 x 7.5 x 2.5 cm.

Right kidney is somewhat tense and hard. Capsule strips well, but there are several small cysts under it in the cortex. The organ is intensely congested, but the cortex is not contracted. The organ is seen to be in a condition of cyanotic induration. Malpighian bodies very prominent: 10 x 2.5 x 8.5 cm. Suprarenals much congested.

Left kidney practically shows the same condition, but no cysts; upon the under surface of the organ is a depressed scar that is puckered and stellate. It is superficial, and does not extend into the body of the organ. It is white and glistening: 10 x 5.5 x 2.5 cm.

Bladder and ureters normal. Suprarenal normal. Pancreas normal. Intestines normal. Stomach normal.

Liver: edges rounded; peritoneal coat over whole organ is opaque, white, glistening, and measures 2 mm. in thickness. The gall-bladder is likewise thickened. No scars extending beneath the surface. On section the organ is of a diffuse yellow-orange color, alternating with deeply congested areas, around the acini, which are deeply congested. The acini are plainly marked, and there is evidently an increase of connective tissue. Bile-ducts are not dilated, and 'at the hilum' seem normal.

Brain and membranes normal: skull somewhat thinner than usual, but no areas of necrosis.

Lungs show no scars upon the pleural surface. Several bronchial glands show extensive softening in their centres.

Microscopic examination revealed a slight increase in the connective tissue elements throughout the different organs, but nothing of interest besides this. The scar in the left kidney showed nothing characteristic. There was a moderate amount of endartertis in both kidneys.

The clinical history of the case being totally unknown, it would seem probable from the post-mortem findings that the aneurism was due to a syphilitic change starting in the walls of the sinus of Valsalva. The rupture has probably taken place some time previous to death, and would have caused an admixture of the arterial with the venous blood. The cause of death seems to be fatty degeneration of the myocardium complicated by the aneurism and sclerotic changes in the parenchymatous organs.

In the seventeen volumes of the Transactions of the Philadelphia Pathological Society there are reported 101 aneurisms, of which 62 were of the arch of the aorta and but 2 of the sinus of Valsalva. Bosdorff reports 48 aneurisms (exclusive of the miliary forms) in a series of 3,108 autopsies: 28 were situated in the arch of the aorta and 2 were in the sinus of Valsalva. In the last twelve volumes of the Middlesex Hospital Reports there are records of 3,030 autopsies. Among these are 45 aneurisms (exclusive of the miliary cerebral forms). Thirty occurred in the arch of the aorta and 2 were of the sinus of Valsalva.

Comparing the figures just given, there are 120 aneurisms of the aortic arch and 6 of the sinus of Valsalva.

In the total number of aneurisms of the list given by Bosdorff and the Middlesex Hospital reports (103) the percentage of this condition was 3.8 per cent. Perhaps some of these cases were nothing but dilatations which should not be counted as true aneurisms, a condition which we have seen in at least three cases.

In 1840 Thurnam collected 22 cases of aneurism affecting these aortic sinuses, which were distributed as follows: Twelve in the right sinus, 4 in the left sinus and 6 in the posterior sinus.

Of the aneurisms in the right sinus 2 had ruptured into the pericardium and 1 into the right ventricle. Two projected in the pericardium and 1 into the right ventricle. 1 projected into the left auricle and 1 into the left ventricle. Of the 6 in the posterior sinus 2 had perforated, 1 each into the right and left auricle. From the character of the opening in the aneurisms that ruptured back into the circulation, comprising three of his list, he concludes that the opening had been present for some time before death, and calls the condition a spontaneous varicose aneurism. Our case belongs to this class, as do the majority of these that we have collected from literature since Thurnam's work. The rupture, of course, does not lead to immediate fatal results, and death apparently occurs oftenest, as in our case, from fatty degeneration of the hypertrophied myocardium.

We have collected 20 cases from the literature on this subject, in a number of which the ante-mortem condition is noted.

Ogle: Male, 42. Aneurism from posterior sinus of Valsalva, projecting and rupturing into the upper and inner parts of the right ventricle. The opening from the sac was plugged with a firm coagulum. Distinct systolic murmur heard at apex. Heart much enlarged and dilated.

Fischel: Aneurism of one of the aortic sinuses rupturing into left ventricle.

Gage: Male, 19. Aneurism from one of the sinuses, admitting phalanges of five fingers projecting and rupturing into right ventricle. Much hypertrophy and dilatation of heart, especially affecting the right ventricle. A double murmur in the aortic area, the systolic transmitted up and the diastolic down.

Lichtenberg: Male, 29. Aneurism of posterior sinus, with an opening into the right ventricle between the anterior and posterior tricuspid leaflets. The sac is the size of a filbert. A double murmur at the base of the heart and in the pulmonary area.

Jansen: Aneurism of one of the sinuses, projecting into the right auricle, without rupture. Aortic valves extensively diseased.

Pepper: Aneurism of one of the sinuses, projecting into the right ventricle by dissecting the muscle and endocardium. The opening of the sac into the aorta was one and one-half inches in diameter. It had ruptured into the pulmonary artery, immediately above the leaflet by an opening of half an inch in diameter. The aortic valves are healthy. The heart is much enlarged, and the left ventricle is especially hypertrophied.

Stokes: Male, 31. Aneurism of one of the sinuses, projecting and rupturing into the conus arteriosus pulmonalis. Slight dyspnea and much edema of legs and scrotum. A thrill was felt over the sternum and a double murmur heard best at the base, but loud enough to be heard all over the chest and also by the patient himself. The systolic murmur was splashing in character and not transmitted to the carotids. Some days before death the patient experienced a sharp pain in his chest, and became weaker. The thrill was henceforth felt only over the apex, and the double murmur was heard best at that point.

Bosdorff: Male, 53 years. Aneurism of one of the sinuses of Valsalva. Clinical diagnosis. Endocarditis and central embolism. There was hypertrophy of the heart, with fatty degeneration and numerous old and recent thrombi in the brain. Atheroma of the aorta and basilar artery.

Bosdorff: Male, 36 years. Aneurism of one of the sinuses of Valsalva. Clinical diagnosis: Endocarditis and insufficiency of aortic valves. There was also cardiac hypertrophy and fatty degeneration, and thrombosis of coronary artery. F. P. Henry: Male. Aneurism of the right sinus of Valsalva, which has opened into the pulmonary artery. The opening is at the point of union of two of the leaflets of the pulmonary valve. Physical signs: Dullness in the left intra-clavicular region. Pulsation and thrill in the second intercostal space to the left of the sternum. A rasping systolic murmur heard best in the same area. No pressure symptoms. Much edema of the legs and scrotum. Middlesex Hospital Reports: Male, 34 years. Aneurism of the left sinus of Valsalva, opening into the conus arteriosus of the pulmonary artery, just below the pul-

monary valves. There was a history of alcohol to excess, but not of syphilis; and severe pain on exertion three weeks before death. Middlesex Hospital Reports: A sacular aneurism of the right sinus of Valsalva, about the size of a racquet ball, projecting into the pericardium. There was no edema. The aortic valves were incompetent and much thickened. The heart was dilated. There was a fusiform aneurism in the descending portion of the arch of the aorta.

Openchovsky: In this case the aneurism was large and followed by disease of the valves of the heart. The article is illustrated.

Beyer: Male, 33 years. An aneurism of the right anterior sinus of Valsalva, the size of a walnut, one inch below the pulmonary valves. The left anterior sinus also dilated, but not to the extent that the right anterior showed. This sac had pushed his way in between the pulmonary artery and the aorta, and was about to rupture into the pericardium. There was a history of rheumatism and syphilis. Physical signs were a double murmur in both the mitral and aortic areas. The heart was fatty. Microscopic sections of the various organs showed a general slight hyperplasia of the connective tissue.

Hawkins: Male, aged 46. Alcohol history. Died suddenly after exertion. No physical examination. Aneurism of the anterior sinus of Valsalva about the size of a filbert. The opening of the right coronary artery is at the base of this aneurism. There is another aneurismal sac involving the left posterior sinus and the wall of the aorta above the valve. The sac was the size of a hazelnut. There is still another dilatation opening from the aorta above the right posterior sinus, which is the size of a hen's egg and had ruptured into the pericardial sac.

Osler has seen ulceration in one of the sinuses of Valsalva which extended into the septum. The upper part presented an aneurismal dilatation which had ruptured into the left ventricle.

Foster: An aneurism of one of the aortic segments which caused during life a soft systolic murmur over the valves; the sac finally rupturing.

Durand–Fardel: Clinical history. Female, aged 49; no rheumatic history; alcoholic. For six months has had attacks of étouffements, palpitation of heart, accompanied by gonflements of the lower limbs. In one of the attacks her face became congested, lower limbs edematous, with extreme oppression and anxious countenance. Lungs filled with moist râles. Heart action increased and irregular. No murmur. Pulse filiform. Urine scanty and containing albumen. Three days after the subsidence of the attack, a distinct murmur of aortic insufficiency developed, without the characteristic pulse. Digitalis had no action. Her condition gradually grew worse, the heart murmur remaining constant.

At the autopsy the heart was found to be considerably hypertrophic, weighing 550 grammes. The aortic leaflets are atheromatous, with colcificile. Devnére la valvule située à la partie postèrienne a rounded orifice

2 centimetres in diameter open into a cavity the size of an English walnut, in places with calcified walls. It extends in the direction of the interauricular walls and the coronary arteries have no connection with the aneurism. Lungs congested. Nutmeg liver. Kidneys small and retracted. No general atherome.

Van Iterson: Aneurism the size of an egg of the right sinus of Valsalva which bulged towards and finally ruptered into the left ventricle. The aneurismal sac bulges well into the right ventricle. The article is well illustrated and contains numerous references to articles upon this subject.

Reynolds: Female, 17 years old. No previous illness, died suddenly after exertion. Aneurism of one of the sinuses of Valsalva about the size of a hazel nut. It had ruptured by a recent slit-like opening into the right auricle.

As is to be expected *a priori*, the number of aneurisms of the sinus of Valsalva greatly predominates in the male. As great confusion exists in the nomenclature of the aortic sinuses, it is impossible to tabulate from which sinus the aneurism has originated. It is best to consider that there are two posterior leaflets and but one anterior.

References.

Bosdorff: Thesis, 1888, Leipsic.
Thurnam: Medico-Chir. Trans., 1840.
Ogle: Trans. London Path. Soc., 1855–56, VII., p. 104.
Fischel: Prag. med. Wochenschrift, 1878, III., p. 1830.
Gage: Boston Med. and Surg. Jour. 1863, XLIX., p. 273.
Lichtenberg: Trans. London Path. Soc., 1865, XVI., p. 97.
Van Iterson: Thesis Leiden, 1871.
Schuman: Thesis, Halle, 1872.
Jansen: Nederlandish. Lancet, 1853, III., p. 34.
Pepper: Trans. Phila. Path Soc., 1874, p. 124.
Stokes: Hayden's Dis. of Heart and Aorta, p. 759.
Durand–Fardel: Progrès méd., 1884, VII., p. 314.
Henry: Trans. Phila. Path. Soc., XVI., p. 111.
Middlesex Hospital Reports, 1893. Cases 218 and 219.
Openchovsky: Vratch, St. Petersburg, 1894. Vol. XV., p. 705.
Beyer: Med. Record (N. Y.) 1882, XXI., p. 200.
Hawkins: Trans. London Path. Soc., 1890, XLII., p. 74.
Osler: Pepper's System of Medicine, Vol. III., p. 636.
Foster: Quain's Dictionary of Medicine, Vol. I., p. 631.
Reynolds: British Medical Journal, February 6, 1897, p. 335.

REMOVAL OF THE DRUMHEAD AND MALLEUS IN CASES OF NEGATIVE RINNÉ.[1]

BY B. M. BEHRENS, M.D.,

Minneapolis, Minn.; formerly Professor of Otology in the Chicago Post-Graduate Medical School.

If there be any appreciable result from the proposition to destroy part of the sound conducting apparatus of the ear, to permit easier access of the sound waves to the internal ear, the originator, the late lamented Samuel Sexton, will be forgiven for the enthusiasm with which his booklet of some years ago on this topic abounded. So far as my own attempts are concerned, I regret to say that the promises which this same booklet held out to otological science and suffering humanity are far from having been fulfilled. Judging from the meagre literature on the subject, most of which denies any positive value to his proposition, and judging also from the experience of fellow physicians, I am inclined to believe that a reaction has already set in, and that the glaring over-valuation of his proposition has borne its fruit, namely, a conviction that there is nothing in it. Such a sweeping statement is entirely out of place, when we consider the fact that a procedure by which a permanent opening of the drumhead might be established, has for years been the prime desideratum of otology.

It is my belief that the removal of the drumhead (the additional removal of the malleus is only incidental, arising from the necessity of depriving the rest of the drumhead of its regenerating power), is indicated in a number of cases and ought to be considered a legitimate procedure, just as much so as any other operation which has for its aim the improvement of an already existing pathological condition; and if this improvement is worth the trouble, it needs no apology, even if we destroy a part or the whole of the sound-conducting apparatus to obtain our end, provided that no other serious objection to laying the drum cavity permanently open outweighs the importance of improved hearing. I know of no such objection, and so far as untoward complications arising from the operation itself are concerned, they ought not to deter us, as an aseptic operation is as easily performed here as in any other locality of the human body. Having established a permanent opening in the drumhead, we merely imitate nature in another way, in that the opening terminates a purulency of the middle ear and prevents the drumhead from closing, thereby preserving hearing which would otherwise be lost, or rather shut up by a whole drumhead. An individual gladly sacrifices his lens, if by so doing his vision can be restored, and if hearing can be restored or improved by sacrificing the drumhead, it is not such a costly thing that it is worth keeping, especially since future health or life is no more endangered by an open drum cavity

[1] Read before the Hennepin County Medical Society.

than by a closed one. This is to be taken *cum grano salis* for the benefit of a procedure which promises to bring joy and happiness to a number of individuals who are seeking relief from a condition which robs them of the most human attribute—a verbal exchange of thoughts with their fellow men. And such a possibility ought to bring joy to the physician also. At any rate, it has acted on my mind as a release from a nightmare, which, for fear of doing harm, would limit my attempts to such an innocent procedure as cutting the anterior or posterior fold of the drumhead, tenotomy of the tensor tympani, scarification and the like, operative procedures which would give very little, if any, relief. Besides, these attempts, although entirely harmless in their execution and consequences, would always be largely empirical without the support of scientific diagnosis. A temporary improvement, due as much to the opening of the drum cavity as to the different delicate operations, has likely won many adherents to the theory that only in a procedure by which a permanently open drum cavity can be secured lies the salvation of a number of cases of deafness that are amenable to no other treatment.

The history of the fight between otology and this little obstreperous thing—the drumhead—is a long one, dating back almost a century, and in spite of all the attacks which have been made, it smiles yet. Total destruction with knife or cautery, repeated time and again, have not availed to deprive it of its vitality, and in desperation it has been even proposed to inoculate it with septic material to break its resistance. Whether or not this risky procedure has ever been practiced, I do not know. I hope not. But even if it has, and with good results, we need have no fear that it would have many imitators, and an idea that it will ever become a legitimate procedure in ear therapy should never for a moment be entertained. The best result ever obtained by cautery was in a case of my own, which was reported many years ago, and to which reference was made in the International Medical Magazine, January, 1894. In this case the drumhead was totally destroyed by cautery, and an eyelet of celluloid was implanted to prevent closing. After about six months it came out, but good hearing remained. I had an opportunity of examining the case six years later. The opening still remained of the same size as the eyelet, and the former patient, when sitting conversing at an ordinary distance (about six feet), had not the least trouble in hearing every word I said. The young man had been practically deaf for several years owing to an attack of mumps, which had reduced his hearing distance to one foot for a loud voice in one ear, and to two feet in the other ear. This case occurred at a time before cocaine was used, and the torture was such that the result did not afford sufficient inducement to have the other ear treated in a similar manner. I must confess that the same case discouraged me for some time, and that in my other occasional attempts to establish a permanent opening, I have met with less gratifying results. I mention this

simply to illustrate the difficulty of procuring a permanent opening in the drumhead by destroying this only, and if the procedure be still employed, it is only because nothing better is known and because the optimists, who imagine that they can do better than their forefathers, are always with us.

Being thoroughly discouraged in my previous efforts to establish a permanent opening in the drumhead, I hailed with delight the proposition to remove the malleus along with it, so as to obtain an open drum cavity. In some cases a secondary removal of the regenerated drumhead has been required, but in no instance had this to be done more than once. In those cases which failed to derive any benefit from the operation, the ultimate fate of the drumhead is not known, as the patients were lost to sight; but in several instances which resulted in but slight benefit to the hearing, I have convinced myself afterwards of the permanency of the opening and of the lasting improvement. As those operated on have been mostly cases of extreme deafness, the harm done to a few has been insignificant, while a little improvement has been appreciated more by the patients than by myself. Of thirty-four cases operated upon, twenty-four have been recorded elsewhere, while I was residing in Chicago, and to-night I have the pleasure of reporting the last ten cases, of which the first six will, in merit, rank with the twenty-four, while the four cases with distinct negative Rinné will prove the immense value of this operation, when the cases are determined by a scientific diagnosis to be suitable for the operation. If no attention be paid to Rinné, and the operation be made haphazard on all cases of deafness, with a good perception of the tuning fork as the only requisite, it will be placed on the same level as the other empirical attempts already mentioned, and do no good to either science or humanity.

The essential requisites for a scientific diagnosis are, good perception of the tuning fork and negative Rinné. The first test is obligatory for differentiating between a central and non-central affliction of the ear. The intensity and extensity of the perception cannot be indicated, because we have no standard by which to measure it. We can speak of good or bad, according to the duration, and we can form an opinion about the intensity also, as these two always are in direct ratio to each other, but only in its relation to aërial conduction will it have any positive value, so far as the operation in question is concerned. As a matter of fact, an investigation tending to lay down a rule for intensity of perception in normal hearing would be time well spent, and would also be of great assistance, but we may have to get along without it, as the prospect of obtaining such a rule is very poor.

Another test which I have found of much value and have recommended for many years, is a preliminary incision in the drumhead, to permit the waves of sound to reach the labyrinth through this opening. I am well aware that an improvement of hearing by this procedure may be due, not so much to the opening, as to the elimination of an abnormal tension of

the drumhead, but even then it must be considered that removal of the drumhead is the only way of relieving abnormal tension. Let me add that abnormal tension is the prime indication for the operation under consideration. That the opening *per se* is the main factor in the improvement of hearing in many cases, is evidenced by the fact that an incision in an atrophic drumhead improves the hearing, which certainly would not be the case if the trouble were due solely to abnormal tension, as an impairment would then be more likely to follow. It is very desirable that this test be applied in all cases before we operate, and the less the difference between perception and aërial conduction, indicating an involvement of the labyrinth, the extent of which might affect the final result of the operation in such a manner as to make it worthless, the more indispensable does the test become. This test is desirable for another reason. We must remember that in our examination with the tuning fork we have to rely upon the intelligence of our patients, who, in very few cases, are able to appreciate or to realize the importance of an exact investigation of perception and aërial conduction, and get easily tired. To move the vibrating tuning fork from the skull to the ear, or *vice versa*, is apt to confound them, and the information we obtain in this way from our patients is not to be relied upon. Besides, the result obtained in this manner in old people is sure to be clouded by the lowered vitality of vibration of the bone of the skull. The best method of finding Rinné, in my estimation, is to make a separate test of perception and hearing by aërial conduction, and not the length of time of each. The best perceptible place is usually the front teeth, and where this cannot be employed, the external meatus. In making separate examinations of perception and hearing by aërial conduction, I have found that in a number of cases where good hearing was present the proportion is as two to three ; that means, if the perception for the big C fork is 60 seconds, the hearing by aërial conduction is 90. As I have previously remarked, there is no standard of measurement for either one, and consequently no standard for this proportion, but for practical demonstration it might be approximately correct. A negative Rinné means, consequently, a reduction of more than 30 seconds of aërial conduction, which proves it a factor diagnostically valuable, but less so in a prognostic respect, so far as the operation in question is concerned, because if this is to be limited to such extreme cases only, its beneficial field is arbitrarily confined, and not all its possibilities will be given a fair trial.

In recommending further investigation along this line, I wish it to be distinctly understood that negative Rinné is not to be taken literally, but rather as a milestone for new discoveries. The disproportion, prejudicial to the latter, between perception and hearing by aërial conduction expresses much better the line along which future investigations are to be made, and it is my sincere wish that surgical procedures performed on the whole drumhead to improve the hearing may obtain a basis more

rational than the empirical attempts practiced up to this time could ever give it. If the experience of my fellow physicians shall establish the correctness of my views here presented, the operation of removal of drumhead and malleus bids fair to become as legitimate a procedure as cataract extraction.

A detailed report of my last six cases, which were operated upon without investigating Rinné, and which in their results are as disconsolate as the twenty-four cases previously reported, will convince you that extreme deafness which defies ordinary treatment, however much we wish it to be so, is in itself no indication for this operation, but only a condition which points to a serious affliction of the conducting apparatus of the ear without involving the labyrinth. It requires more enthusiasm than there is at my command to feel happy at an improvement represented by an increase of one or two feet of distance for loud voice. This is almost childish in my estimation, and does not excuse, much less justify, such a serious undertaking as the operative precedure under consideration.

Report of Cases.

M. L., physician, 36 years of age, has been becoming hard of hearing for the last ten years. His deafness has now reached such a stage that he feels compelled to give up his professional calling, and will, after having seen several specialists without benefit, have to resort to the removal of the drumhead as a last attempt. D. Distance for watch = 0. D. Distance for Politzer's acumeter = 0. Perception for the tuning fork is good. Hears a loud voice at three feet. No improvement after operation on one ear.

Case 2. H. S., 25 years old, has now and then been under specialistic treatment since early youth, but in spite of this the hearing has steadily been on the decrease. D. Distance for watch = 0. D. Distance for Politzer's acumeter, 3 cm. on the right, and 2 cm. on the left. The perception for the tuning fork was good and to the left. The left ear was operated, and the distance for a loud voice increased from four to six feet.

Case 3. Lina L., 27 years of age. Has been hard of hearing for the last seven years, and was never benefited by treatment. D. on the right ear, 1 cm. D. on the left ear, 2 cm. Had good perception for the tuning fork and to the right. The right ear was operated on. While performing the preliminary incision in the drumhead the patient made a quick move of her head and fainted away. The head suddenly fell down to the opposite side, striking against the table. Quick as a flash, she raised it again and asked me to go on with the operation. A small plug of iodoformed cotton was applied to the incision and examination postponed until the next day. An actual improvement had taken place, and the operation of removing the drumhead and malleus was therefore performed, with increase of distance for loud voice from three to five feet.

Case 4. I. R. T., 55 years of age. Has been deaf for the last 15 years, and has had no treatment. Can hear a loud voice only at close range, and no better with speaking tube. Perception for the tuning fork was good, but of short duration. Wanted the operation as a last resort, but did not obtain the least benefit.

Case 5. Cora D., 30 years of age. Historia morbi of ten years standing. D. on the left ear = 0; on the right ear, 1 cm. D. on the left ear = 2; on the right

ear, 5 cm. Tuning fork to the left. Operation was made on the left ear. Patient imagined that she could hear the watch. Improvement for loud voice two feet, but the drumhead regenerated in a short time, and as she suffered a good deal from chloroform malaise after the operation and the little improvement gradually disappeared again, she concluded to have no more operating on her ears.

Case 6. P. B., physician, 37 years of age. Has been treated at different times without benefit. Hears loud voice at three feet. Tuning fork good and to the right. Operation was performed on this ear, resulting in increase of distance for loud voice to five feet. Does not want operation on the other ear. This patient imagined that he had obtained much benefit, and that he could better practice his profession now than before. He has likely since found that he was mistaken. The fact that he did not apply for similar treatment for the other ear is proof of failure of the operation of more weight than any assurance of his to the contrary.

In two of these six cases the incus was also removed, but no more benefit was obtained, corroborating the view that I have held in my earlier reports, that where very little or no improvement is produced by the operation, removal of the incus is not likely to add to it. Still, this is one of the points, and a very important one, too, which has to be further investigated when we operate on negative Rinné, and it will then come under the head of a secondary operation.

The four cases which I am now going to report did not call for a removal of the incus, as the improvement obtained by removal of the drumhead and malleus only was all that could be desired.

Case 1. Chris. B., 28 years of age, has been hard of hearing since 16 years of age, and has been repeatedly treated with no benefit. D. on the left ear, 2 cm.; on the right, 1 cm. D. on the left ear, 6 cm.; on the right, 3 cm. Perception of tuning fork good and to the right. Rinné negative. Operation on right ear. Distance for common voice increased from four to twelve feet.

Case 2. O. O. S., 37 years of age. Heard loud voice in the left ear only at two feet; in the right ear at three feet. Perception of tuning fork good and to the left. Rinné negative. After operation on the left ear, distance for loud voice increased to 12 feet.

Case 3. Henry S., 64 years of age, has been hard of hearing for over twenty years. Tuning fork to the right, and Rinné negative. After operation on the right ear, distance for loud voice increased from three to ten feet. Three months later, operation on the left ear with as much improvement.

Case 4. G. B., 25 years of age. Hard of hearing for the last five years. No improvement after ordinary treatment. D. on right ear, 2 cm.; on left, 1 cm. D. on right ear, 5 cm.; on left, 2 cm. Tuning fork to the left, and Rinné negative. Heard a loud voice at two feet in the left and three feet in the right ear. The left ear was operated on first, and two weeks later the right. Can now hear loud talk in either ear at ten feet.

A few details regarding these four cases will illustrate not only the necessity of the operation, but also that no other treatment could have brought about such results.

Case 1. Chris B., had been hard of hearing sixteen years, with slight alterations due to weather and subjective feeling. Catarrh treatment and Politzer had been employed with no benefit to the ears. The only abnormal aspect of

the drumheads was an indrawing and perspective shortening of the manubrium, which did not yield to Politzer or the tube catheter. After a preliminary incision in the drumhead the hearing rose to ten feet for whisper. After removal of the drumhead and malleus, the distance for common voice was 12 feet, a result not so good as the incision promised, but sufficiently good to warrant operative interference on the other ear. The patient was obliged to go away, and I have not seen him since.

Case 2. O. O. S., had been hard of hearing for more than ten years. He had not attended meetings for many years, which was testified to by his minister, who accompanied him to my office. Catarrh treatment had not benefited his ears, and ordinary treatment was not what he applied for. The same retraction of the manubrium was seen here as in the first case, otherwise there was very little worth mentioning. The removal of the drumhead and malleus was performed without any preliminary incision, and the distance for loud voice rose from 2 to 12 feet. Quite a reaction set in afterwards, which resulted in a suppuration of the middle ear that lasted for some time, which was caused more by his restless manipulation than by any fault of mine, and as he suffered much pain, he concluded to have no operation done on the other ear. The following year, about ten months later, I had an opportunity of finding out the status of his hearing, and I convinced myself of considerable improvement, as I could easily converse with him at a distance of about six feet, the surrounding darkness precluding lip-reading, in which he was not very proficient. Tenotomy of tensor tympani has formerly been performed in such cases without gratifying results.

Case 3. Henry S., was such a healthy, well balanced individual, bodily and mentally, that I assumed his case to be one of stapes ankylosis or sclerotic catarrh of the middle ear until I applied Rinné's test. There was no catarrh of the nose or throat, and even Politzer's proceeding was easy to perform. Rinné being distinctly negative, I performed the removal of the drumhead and malleus, first on the right ear and three months later on the left. No regeneration of the drumheads had taken place from spring to fall, and conversation was easily carried on at an ordinary distance.

Case 4. G. B., 25 years of age, had been hard of hearing only five years. He had been treated for catarrh with little benefit to the hearing. Inspection of the nose and throat revealed an atrophic catarrh in its incipient stage, and also the commencement of paralysis of the palate. The drumhead was lustreless, and the pyramidal light indistinct; moving to and fro under the Siegle pneumatic otoscope, but no abnormal position of the malleus. The long process of the incus was easily discernible. The physician who had treated her sent her to me for operation, as he had found out that an incision in the drumhead had resulted in quite an improvement of her hearing. This fact, besides the negative Rinné, gave promise of a good result, which also was realized to the extent that she now enjoys good hearing and can join, without much trouble, in conversation.

These four cases, besides the one in which a permanent opening was established by the introduction of an eyelet, show the value of laying open the drum cavity where Rinné is negative. To further detail the subjective and objective symptoms of these five cases would throw no more light upon their impracticability to ordinary treatment than does the fact that they were of long standing and amenable to no such methods.

Concluding Remarks.

Up to the present time the radical operation of removing the drumhead and malleus has been performed on thirty-four cases, of which thirty have given very little improvement or none whatever. All of these were extreme cases, the hearing being reduced in most of them to a short distance even for loud voice. In none of them was any attention paid to Rinné, but to perception for the vibrating tuning fork only, which was in almost all of them very good. Recently I have operated only on negative Rinné. As previously mentioned, it might not be indispensable to have Rinné distinctly negative, but a condition pointing to a prevailing affliction of the middle ear with no involvement of the labyrinth affords an indication for this operation, the result of which is so much the better the less the affection of those parts of the middle ear which are in intimate contact with the internal ear. If I were to exclude any special disease of the middle ear as contra-indicating the operation, it would be principally the sclerotic catarrh, as a rigidity of the membranes in the oval and round windows cannot possibly be benefited by removing the drumhead and malleus, or incus, also, for that matter. With as good reason might this be said concerning similar conditions caused by purulency of the middle ear, and no matter whether the ankylotic rigidity be the only outcome, or the internal ear is secondarily affected, as generally follows, not only will our operations be out of place, but the delicate mechanism of a sound conducting apparatus, even though diseased, can be the less dispensed with in this case. Diseases of the middle ear of a more mild character and never transgressing it, such, for instance, as a serous or sero-fibrinous catarrh with subsequent abnormal fixations, or afflictions of the membrana tympani with subsequent rigidity or flaccidity, the mechanical effects of disturbed ventilation of the middle ear, caused by affections of the eustachian tube or its adnexa, are the ones which are most likely to be benefited by the operation, and whether or not its beneficial effect can be further extended with some degree of certainty is a question for future solution.

Temporarily, I take the liberty of presenting my thirty failures as evidence of its futility in cases of affliction beyond the middle ear proper, and, while other operators are gleeful at an improvement of one or two feet for common or loud voice, I am not able to share their happiness. However much we wish to embrace all cases of deafness for the blessed effect of this operation, it is evident that such an indication is as good as none at all. If employed haphazard, we put it on the level with other empirical operations practiced upon the ear, and reduce it to uncalled for mutilation for which there is no excuse whatever. A patient walking around with an open drum cavity deprived of one or two of its ossicles, and with no better hearing than before, is a poor consolation for a false enthusiasm, based only on hypothetical expectations which were never realized. In that event, the fault is not with the operation itself, but with our expecta-

tions. It is by this time established as a fact beyond doubt that the removal of the drumhead and malleus is sufficient to secure a permanently open drum cavity; furthermore, it is better than any other proposition ever presented to the otologist. The struggle for establishing an opening in the drumhead is almost a century old and has had heretofore nothing but failures to show. This operation ends the struggle, and there is nothing more to be desired except positive indications for its employment to protect it from the discredit sure to befall it, if it is not surrounded by all possible safeguards. No matter whether an improvement of hearing by an incision in the drumhead is due to the altered tension or to the opening itself, this test, with its seal of one hundred years endorsement, ought to be treasured as a mile-stone for further investigating the usefulness of this operation. Historia morbi, expert physical examination, etc., are well enough, but they are not sufficient to decide *pro* or *con* an operation which ultimately might end in mutilation only. And, being already on the wrong track, further mutilation, beyond removal of the drumhead and malleus, is well-nigh a crime. Removal of the incus, for instance, in five cases has given no better results, and in cases of the preliminary incision failing to be followed by any improvement, the operation in question would result in no benefit whatever, or at most in such insignificant improvement as above reported. From this I can conclude only, that our best safeguards against an ill-timed operation are Rinné's test and a preliminary incision in the drumhead. If Rinné is distinctly negative and the incision is followed by an improved hearing, then, and only then, is the removal of the drumhead and malleus indicated, because an ear is better off without any sound conducting apparatus than with one which does not conduct, or rather, one which prevents the waves of sound from reaching the internal ear, provided this has not suffered too. For several years I have recommended this preliminary incision as being of prognostic value, and, considering its harmlessness, there is no excuse for not employing it. When done thoroughly to allow the waves of sound to strike the stapes and foramen rotundum, it gives us all the information we can expect. For that reason, it ought to be made back of and along the manubrium from top to bottom; if it produces no improvement of hearing, the best thing we can do is to put a piece of iodoformed cotton in the incision, and in a couple of days all will be well again, and no damage will have been done. I have made this test in more than one hundred cases and have never seen any ill effect from it, either to the hearing or to the drumhead. In cases in which I have disregarded the hint and operated, as I have done in a few instances, I was sorry for it afterwards. In all cases of improvement after the preliminary incision the operation has been very successful, although I must admit that the benefit has not been so pronounced as the tentative incision would lead me to expect, proving that a corrected tension is, of course, better than a removal; but we have to be satisfied with what is obtainable and, if we

cannot have the best, with the next best. The incision ought to be employed only by those who are familiar with the minor surgery of the ear. Without this means diagnosis will have to rely on the outcome of tests with the vibrating tuning fork. To exclude all external sounds the ears are closed with one finger in each. When perception ceases the fork is placed in front of and close to the meatus, the finger, of course, being removed; if it is heard, Rinné is positive, and the particular case cannot be benefited by this operation. If hearing by aërial conduction is shorter than perception, the preliminary incision is performed for the surgeon's benefit.

It is my sincere wish that Rinné's test be practiced by the whole medical profession. Only in this way can a great number of unhappy individuals find the help of which they are in sore need, and those who cannot be assisted have, at least, their burden increased with no distrust to the medical profession, when they are told the truth. The tuning fork is to the ear what the ophthalmoscope is to the eye. It will establish what part of the organ is out of time, so to speak, and the operation under consideration will become as legitimate a procedure as cataract extraction on the eye. Otology has already been waiting too long for such a glorious triumph.

REVIEW OF MEDICINE.

MEDICINE.

A Case of Systolic Centrifugal Venous Pulsation without Tricuspid Stenosis. (*Berliner klinische Wochenschrift*, February 8, 1897.) By M. Futran, of Charkow.

Two varieties of systolic nervous pulsation are recognized. The first is the centrifugal or pulse of regurgitation, observed in incompetency of the tricuspid valve. It occurs in the veins of the neck and is often associated with pulsation of the liver. The second is the centripetal pulse, which is seen in the capillaries and small veins. It occurs in aortic regurgitation and is explained by the fact that the shock of the column of blood is not stopped in the capillaries but penetrates to the smaller veins. The centripetal pulse is stopped by distal pressure, the centrifugal by proximal pressure. A male, forty-nine years of age, was admitted to the hospital with a history of four years cough, dyspnea, and palpitation. For one year there had been intermittent edema of the legs. Some cyanosis and icterus, very marked pulsation below the ensiform cartilage (sub scrobiculo cordis) but not in the epigastrium. Apex displaced to left. Jugular veins are dilated and pulsating, and this is not affected by respiration. Veins fill from the cardiac side more quickly than from the peripheral side. Pulsation also in many of the systemic veins. No capillary pulse.

Pulsation of the arteries of the neck and upper extremities. Fibrosis of the peripheral arteries. Radial pulses full and equal. Heart enlarged to left and right. An intense systolic murmur at the apex. II sound pure, Pulmonary area: I pure, II accentuated. Aortic area: I pure, II accentuated. Tricuspid area: I accentuated but pure, II pure. A blowing systolic murmur over the vena mediana colli and vena jugularis. Liver enlarged and somewhat tender. No pulsation or murmur. F. excludes the possibility of the pulsation of the cervical veins being transmitted from the aorta or arteries of the neck, or that it is the systolic emptying and diastolic filling of the veins from inspiratory suction from within the thorax. The condition must be one of true centrifugal or regurgitating pulsation. However, in view of the entire absence of murmur at the tricuspid valve, the accentuated I sound heard in that region, the marked pulsation seen below the epigastrium, and the accentuated pulmonic II sound, the possibility of tricuspid insufficiency must be excluded. How then is there regurgitation into the veins? The only reasonable explanation is that there is a patulous foramen ovale, associated with mitral regurgitation. Thus, during systole, the pressure is much greater in the left auricle than in the right, and the blood is forced through the patulous foramen into the right auricle and venæ cavæ. F. mentions three cases that he has collected from the literature upon the subject, which exhibited the same physical signs, and at the autopsy a patulous foramen ovale and mitral insufficiency. A postscript states that, although the cardiac insufficiency has disappeared, the venous phenomena remain the same.

STEELE.

A Simplication of the Method of Serum Diagnosis of Typhoid Fever. (*Centralbl. f. Bakt., Parasit., u. Inf. Vr.*, January 20, '97.) By Dr. Pfuhl.

The author prefaces the description of his method with a report of his experience with the Widal reaction, agreeing with the now almost universal testimony that this reaction occurs regularly in all cases of typhoid fever, at some period of their course, and is never, or only imperfectly, in any other disease. His method is to mix a drop of blood with ten drops of water and then, adding a drop of this to a similar quantity of typhoid bouillon culture, to examine in the hanging drop as by the ordinary technique. If it is not possible to make this dilution at once, the reaction is in no way influenced; ten drops of water, mixed with one drop of dried blood acting quite as well, thus enabling the specimens to be carried a considerable distance before the test is made, or even to be sent by the post. It must not be overlooked, however, that the reaction occurs much more slowly if the blood is kept more than two days. He has found this reaction of value in controling the history as given by the patient. In one case, where it was doubtful whether typhoid fever had existed two

months before, the reaction was positive, and it was taken for granted that it did. Pfuhl has finally reached such a degree of confidence, that he now uses the blood of typhoid fever patients to test his cultures, in order to find out whether they are typhoid bacilli or not.

SAILER.

On Motor-insufficience of the Stomach. (*Berl. klin. Woch.*, No. 11, 1897.) By Rosenheim.

The motor power of the stomach is often the most important point to determine, and this is by no means always dependent upon the capacity of the organ. Splashing under the umbilicus five hours after ingestion of fluid, visible peristaltic and antiperistaltic waves and vomiting of long-retained food are aids in diagnosis, but the latter is only assured by the discovery that the stomach is not empty seven hours after a test dinner or three hours after a test breakfast, or even more positively after a night's fast. The motor weakness may occur suddenly in neurasthenic individuals and after errors in diet when it usually disappears soon with proper handling. But a sudden onset is apt to occur after injury, even when this does not directly affect the stomach, and is then due to a paralytic condition of the viscus which may become permanent and resist treatment strongly. The gastric crises of tabes may cause motor weakness by overstrain in vomiting, and the condition is frequently present in connection with the epigastric herniæ of which Witzel, Linden, Bohland, and others have written. The prognosis is usually, but not always, dependent upon the grade of the insufficience. In patients of nervous dispositions, especially, one often finds mild grade which is very persistent and a prognosis can never be except after watching the results of treatment for a time. Treatment should be (1) dietetic—a dry diet when the stomach can not empty itself of moderate quantities of liquids, and when the patient cannot rest after meals. When these two conditions can be fulfilled fluid may be allowed in small quantities frequently taken. (2) Local—contrary to Boas he considers local treatment always indicated—in severe forms to remove food remnants and prevent fermentation, in less severe cases for its tonic effect, and one should always use the douche as recommended by the author, fluids of low temperature (22°–25°C.) and containing one of the numerous stomachics. Massage, electricity and particularly hydrotherapy are of use for their constitutional effects. When this treatment has no good results gastroenterostomy is in place. He warns strongly against the milder procedure of only breaking up adhesions, as such cases usually relapse and are often worse subsequently.

EDSALL.

The Secretory Nerve of the Stomach. (*Zeitsch. f. klin. Med.*, Vol. XXXII., Nos. 1 and 2.) By Schneyer.

All researches hitherto on the secretory nerve of the stomach have

been without reliable results excepting those of Pawlow and Schumowa who have reasoned indirectly from their experiments that the vagus possessed this function. Schneyer has now given proof of this by direct stimulation of the vagi in dogs. The esophagus was tied to prevent entrance of anything into the stomach from above and a tube introduced through the pylorus from a duodenal fistula. Stimulation of the vagus in the neck caused secretion of a liquid in the stomach that had the chemical and physiological characters of gastric juice. Only stimulation of the vagus *in toto*, or of the peripheral end of the severed nerve gave this result, while it was not accomplished with this treatment of the central portion of the vagus or any portion of the splanchnic. Hence he concludes that the vagus is the gastric secretory nerve. The results of his experiments would also, at first glance, add weight to Hayem's theory that the stomach secretion contains fixed chlorides but no free HCl and that the ingestion of food alone aroused "fermentative reactions" which produced free HCl from the chlorides. In many of his experiments the secreted liquid contained goodly amounts of fixed chlorides but no free HCl and did not digest fibrin. This is, however, explained by the inanition resulting from the previous 48-hour fast to which the dogs had been subjected, since when nutrient enemata were administered the same stimulus caused secretion of fluid containing free HCl and pepsin. This result is of practical importance, as it indicates that one may not diagnose glandular atrophy from absence of HCl as inanition in man may well suffice to cause deficient secretion.

EDSALL.

On Meat Substitutes. (*Berliner klin. Wochensch.*, 1897, No. 8.) By Bornstein.

So-called "peptones" can not be used as a substitute for meat in more than two-thirds the quantity necessary even with normal digestive system, without exciting diarrhea and thus preventing their absorption. Neumeister explains this apparent anomaly by calling attention to the fact that peptones produced in the digestive tract are quickly absorbed and the bowel never has normally to deal with so large quantities as are present after ingestion of artificial preparations. The same is true of other albumose preparations such as somatose. It is therefore better to attempt substitution by means of pure albumen not predigested and which is in a form to be readily digested. Such is nutrose *i. e.* casein combined with sodium. Bornstein dieted himself through certain periods, in some of which the diet contained meat in undigested condition, in others a portion of the meat was replaced by nutrose or peptones. The nitrogen in the ingested food and in the urine and feces was estimated by Kjehldal's method. The results evidenced that peptones were absorbed in lesser amount than the meat and the nitrogen-elimination very closely approached the amount

ingested. While, when on the nutrose diet, the absorption was somewhat better than that of the meat, and elimination was much less than ingestion. Entirely replacing the meat by nutrose and by somatose, the results were decidedly against somatose in both particulars, the elimination exceeding the ingestion, and severe diarrhea ensued. The nutrose diet had no ill results, and showed an even more marked advantage over the meat that in the first experiments. Like comparisons of meat and aleuronat showed the latter to be more useful than the albumoses mentioned and no intestinal disturbance was caused. The nitrogen-balance was, however, very low. Bornstein therefore recommends nutrose as an inexpensive non-irritant, pleasant, and suitable substitute for meat when liquids are necessary, and where it is desired to lessen the amount of feces, as in atony and ulcerations of and operations upon the digestive tract.

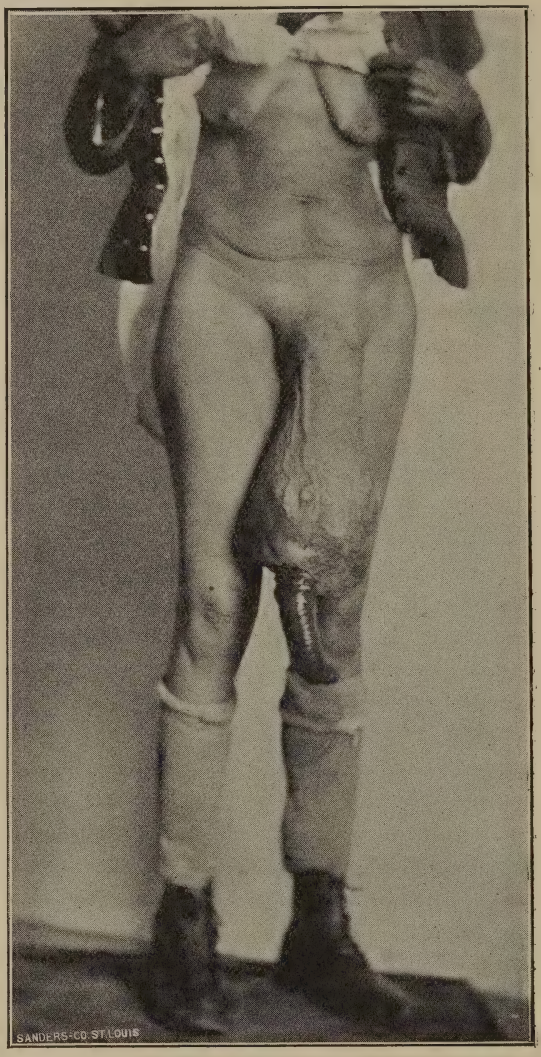
EDSALL.

SURGERY.

Production of an Artificial Anus in an Inguinal Hernia by Mother Nature's Surgery. (*Memphis Medical Monthly*, March, 1897.) By A. K. West, M.D., of Smithville, Tenn.

West accidentally discovered the tumor in a woman aged 54 years, who had come to him for treatment of a functional heart trouble. She was married at seventeen, and after five normal labors a tumor, about the size of an egg, appeared in the left inguinal region. This came without pain or other symptoms, and remained stationary till her next pregnancy, during which it rapidly increased in size. The rapid growth recurred with each succeeding pregnancy till the ninth, twelve years since its appearance, when it had reached its present size. A few weeks after the birth of the ninth child an abscess formed within the tumor, which opened at its most dependent part, discharging a quantity of pus mixed with fecal matter; the inflammation gradually subsided and the pus flow ceased, but the fecal fistula remained permanent. During the two years immediately following this the rectum and anus performed their functions normally, the fistula, however, remaining patulous, and discharging small quantities of feces from time to time, the discharge gradually increasing until the artificial anus assumed the whole function, the natural channel being entirely occluded; since that time, sixteen years ago, she has passed nothing per anum save occasional small quantities of white, tenacious mucus. The elongation, noted in the cut, is a prolapsus of the artifical anus; there are eight inches of this protruding, and it is evidently some part of the colon. It is covered with a very hyperemic mucous membrane, which bleeds easily, but is very slightly sensitive to external irritation. The peculiar vermicular action is entirely normal, and goes on continually in this external viscus. The patient wears no support of any kind, but instead pins closely around the pedicle

the napkin she wears for receiving the continual fecal discharge, the whole pendulous mass swinging free between the knees. Her fecundity has in no manner been interfered with, since she has borne three children since this fistula was established—twelve in all. There is no impairment of digestion or nutrition; she has even escaped that bane of old women, constipation, with its attendant ills. The external covering of the mass seems to be an attenuation of the cuticle covering the left inguinal region and labium major; it is very thin, and the contortions of the intestines can be easily noted within. The sac contains the greater portion of the intestinal tract, with the omentum. The other abdominal and pelvic organs are normally located and in a healthy state. The unique feature of this case is the location of the fistula at the lower extremity of the sac instead of at the neck, the usual point of constriction. This is possibly not the result of strangulation at all. That oft-offending member, the appendix, is missing from its normal site, and perhaps we have here the result of an old appendicitis. Almost equally unique is the extraordinary prolapsus, eight inches of the gut being permanently extruded, making the real anus down between the knee and ankle. The patient seems to be quite hearty and happy; her twelve children and nineteen grandchildren are living with and around her. She raises poultry, comes to town in a two-horse wagon every few weeks to sell produce, and, notwithstanding her infirmity, bids fair to live several decades yet.



CATTELL.

NEUROLOGY.

Concerning the So-called Convulsion Centre and Centre for Locomotion in the Region of the Pons. (*Neurologisches Centralblatt*, No. 4, 1897.) By Professor W. von Bechterew, of St. Petersburg.

Suschtschinski and Wyrubow conducted experiments in von Bechterew's laboratory to determine the existence of a convulsion centre in the region of the pons. They found that a needle thrust into the pons of a rabbit causes a true epileptic attack, such as is produced by cortical irritation. By means of the electric needle placed within the pons convulsions were also produced in dogs. It was demonstrated by the experiments of Wyrubow that a transverse section, at the quadrigemina, of the brain of rabbits causes opisthotonos and clonic contractions of a few moments' duration, but if a needle be thrust into the region of the pons after the section is made it only causes increased opisthotonos, and the attack is not truly epileptic. After removal of the cerebral cortex, epileptic attacks could not be produced in rabbits by irritation of the pons with the needle, even though the basal ganglia were left. These experiments prove that the convulsions caused by irritation of the pons are due, not to irritation of the convulsion centre, but to transmission of the irritation to the cerebral hemisphere, and especially to the motor cortex. In other experiments, by Meyer, epileptic attacks were produced in dogs and cats by the introduction of absinthin and cinchonin into the circulation, and during the attacks transverse section of the brain was made at the quadrigemina, when the clonic convulsions immediately ceased, and only extension of the extremities and opisthotonos were observed. No true epileptic convulsions could be produced in animals in which the section had been made before the administration of these drugs, or in which the motor cortex had previously been removed. These experiments, like the former, show that the convulsions are due to irritation of the cerebral cortex, and that irritation of the basal parts of the brain can, at most, produce only tonic contractions. The experiments of Todoski and Borischpolsky have demonstrated that in epileptic convulsions there is apparently an increased flow of blood to the brain, with contraction of the arteries of the body, and von Bechterew believes that the needle thrust into the pons causes this condition, and so produces the epileptic attack. A needle thrust does not produce convulsions in a dog, probably because, by reason of the larger size of the pons, the vasomotor centre is not sufficiently irritated, and as a more extensive lesion injures the motor tracts, convulsive movements are, of course, prevented. von Bechterew believes that a bilateral centre for locomotion exists in the bulbopontine region, inasmuch as transverse section of the brain above this region in higher animals does not prevent regular, combined movements, such as are seen in running, although these movements are rendered impossible when the separation is made in the

region of the oblongata. It is possible that irritation of this centre may cause tonic contractions, although those of the clonic type are not produced. Von Bechterew will not claim that clonic convulsions are caused only by irritation of the cerebral cortex; still, he has demonstrated that the movements, so characteristic of epilepsy, are not produced by irritation of the pons or other subcortical parts.

SPILLER.

A Case of Periodically Recurring Oculomotor Paralysis. (*Neurologisches Centralblatt*, No. 5, 1897.) By G. Kljatschkin, M.D., of Kasan, Russia.

According to the writer, only twenty-five cases of periodically recurring paralysis of the third nerve have been reported in the literature. He makes, however, no reference to De Schweinitz's paper. A child of fifteen had suffered for years from malaria and headache. The paralysis was first evidenced in an inability to fully raise the left lid, and later headache, intermittent fever, and a painful sensation in the left eye were present. On examination the left eyeball was found to be turned outward, and the pupil did not react to light and convergence. A slight diminution of the sense of touch and pain in the region supplied by the first branch of the left trigeminus was also noticed. Improvement was observed after counter-irritation and administration of large doses of quinine. Recovery was perfect, but within a few weeks there was a return of the paralysis of the left lid, which was again overcome by quinine. A third attack occurred, and was also followed by recovery. The writer thinks that, considering the loss of pupillary reaction, the lesion could not have been cortical, and it was probably not nuclear, as the inner eye-muscles were affected, the lesion was unilateral, and other cranial nerves, except the first branch of the fifth, were not involved. He believes the case was one of peripheral neuritis due to malaria. In the three cases of this affection, in which autopsies have been obtained, pathological changes have been detected.

SPILLER.

Experimental Investigations on the Origin of the Trigeminal Nerve. (*Neurologisches Centralblatt*, No. 5, 1897.) By G. Kljatschkin, M.D., of Kasan, Russia.

Injury of the trigeminal nerve at the base of the brain caused degeneration of the motor and sensory roots as far as the nuclei, and descending degeneration of the spinal root, the fibres of which could be traced into the substantia rolandi as far as the second cervical nerves, but no degeneration could be found in the fibres which extend from the trigeminus into the cerebellum, or into the substantia ferruginea. Injury of the spinal root of the trigeminus at the level of the olives caused degeneration of the

lower part of the root as far as the second cervical nerves. Only a few degenerated fibres were observed above the section, and these appeared to enter the corpus restiforme at the level of the exit of the abducens. The writer could find no degenerated fibres in the portio major. Injury of the brain stem in the region of the upper corpora quadrigemina, where the large cells of the fifth nerve are found, was the cause of distinct descending degeneration of the cerebral root, and these degenerated fibres could be traced into the motor root, and into the motor nucleus. No connection of the cerebellum with the trigeminus, by means of the direct sensory root, could be observed in injury of the part of the cerebellum near the trigeminal nuclei. In injury of the fasciculus longitudinalis posterior degenerated fibres could be traced into the motor nuclei, and the writer thinks that this fasciculus contains the central tract of the fifth nerve.

SPILLER.

Infantile Cerebral Degeneration, with Symmetrical Changes at the Macula. (*Royal Medical and Chirurgical Society. The Lancet*, January 16, 1897.)

In the report of the meeting of this society on January 12, 1897, Kingdon and Risien Russell describes a peculiar disease, which occurred in four children. The disease begins in the early months of infantile life with muscular enfeeblement in association with distinctive ophthalmoscopic changes and is followed by complete paralysis, and an eventually fatal issue about the end of the second year. There is no discrimination in regard to sex. The disease is a family affection, but it has no apparent connection with syphilis, consanguinity of marriage, or any of the usual hereditary diatheses. The Jewish race seems to be especially predisposed. In the first stage the child, born at full term and healthly, about the end of the third month begins to show signs of muscular enfeeblement and of failure of sight. Definite and characteristic changes in the region of the macula can be detected about the fourth or fifth month. In the second stage the child can not sit up, and vision is almost entirely lost. In the third stage, the enfeebled muscles become atrophied; the deep reflexes are exaggerated, and later there is rigidity of the extremities and retraction of the head. Convulsions do not usually occur, and the temperature remains normal. Subjects of this disease usually die within two years. Symmetrical degeneration of the pyramidal cells of the cerebral cortex, and of the fibres of the corona radiata and pyramidal tracts throughout their course appears upon microscopic examination. Symmetrical degeneration may also be found in the fillet, in the spinal root of the fifth nerve, and superior cerebellar peduncle. The retina may be much thickened at the yellow spot, and the optic nerve atrophied. [This disease has previously been described by B. Sachs, in the *New York Medical Journal*, May 30, 1896.]

SPILLER.

General Paralysis in Two Sisters, Commencing at the Age of Ten and Fifteen Respectively.—Autopsy in one Case. (*The Journal of Nervous and Mental Disease*, February, 1897.) By August Hoch, M.D.

General paresis occurring in persons under the age of twenty is uncommon. Hoch reports two cases, one of which was with autopsy. Attention was attracted to one sister by an inclination to laziness at the age of ten; about a year later, however, marked motor symptoms were observed. The disease, after this, was progressive. Impairment of the intellect was noticed in the other sister at the age of fifteen. The gait and speech became affected, and the clinical picture, as in the first case, was typical of general paresis. These two girls were the youngest of seven children, none of whom have died, except the first case described in this paper. All the other children are normal. There were some suspicious signs of syphilis in the father. Microscopic examination of the nervous system of the first case showed thickening and infiltration of the cerebral pia. The cerebral cortex presented a reticulated appearance. There was enlargement of the pericellular and perivascular spaces, increase in the number of nuclei throughout the tissue, and great infiltration of the adventitial spaces with lymphoid cells. The nerve fibres were diminished. Changes were found in the thalamus and cerebellum similar to those of the cerebral cortex. Some of the cells of Purkinje were notably altered. Degenerated fibres were found in the columns of Gowers, and in the pyramidal tracts, and in the latter they could be traced into the pons, but not into the cerebral peduncles. Some of the ganglion cells of the anterior horns, especially in the thoracic region, were much altered. Some degeneration was also noticed in the cells of the nuclei in the oblongata and pons. Infiltration about the vessels was also found in the pons. The neuroglia of the gray matter of the cervical and upper thoracic cord was proliferated. The degeneration of the pyramidal tracts, though not observed above the pons, is supposed to have been the result of destruction of cortical cells, and the limitation of this process to the peripheral portions of these tracts is explained by the well-known theory that the distal end of the neurone is first affected in slow degeneration. The alteration in the columns of Gowers is explained by the degeneration of the cells in the spinal cinerea.

SPILLER.

PATHOLOGY.

Experimental Cirrhosis of the Liver. (*Beiträge zur path. Anat. u. zur allg. Path.*, Vol. XX., No. 2, 1896.) By Professor Siegenbeck van Heukelom, of the Boerhaave Laboratory, Leiden.

Numerous experiments have been undertaken by different investigators with the object of producing cirrhosis in the livers of the lower animals.

In an exhaustive article van Heukelom analyzes the methods and results and then considers them in relation to cirrhosis of the liver as seen in man. The following methods have been used in attempts to produce, experimentally, cirrhosis of the liver: A.—By action on the gall-passages: 1. Ligature of the ductus choledochus. 2. Ligature of its component parts. 3. Injuries to the ductus choledochus. 4. Injection of various materials into this canal. B.—By action on the portal circulation: 5. Closure of the portal vein. 6. Closure of its branches. 7. Embolism of the branches of the portal vein in the liver. C.—By action on the hepatic artery: 8. Ligature of the artery or its branches. D.—By the administration of poisons or other injurious substances in small doses: 9. Alcohol. 10. Phosphorus. 11. Preparations containing arsenic. 12. Salts of lead. 13. Different fatty acids, organic compounds, and decomposing substances. E.—By repeated subcutaneous injections of: 14. Dead bacteria and their toxins. 15. Chloroform. 16. Alcohol. F.—By direct injection of injurious substances into the parenchyma of the liver: 17. Silver nitrate, carbolic acid, and croton oil. G.—By asceptic irritation of the peritoneal covering of the liver. 18. By the introduction of a tin foil between the liver and the diaphragm. 19. By observations made upon the cirrhosis induced in animals by the presence of parasites in the liver. The author's conclusions are:

1. Substances such as alcohol are capable of producing degeneration of the liver cells without the new formation of connective tissue. 2. Litten recognized cellular necrosis in embolism of the portal branches, but found no new connective tissue, and Solowieff's experiments did not exclude sepsis. 3. Cellular necrosis occurs in nearly all operative experiments, at times with encapsulation by fibrous tissue, but without cirrhosis except in those cases where the process was markedly complicated. 4. While necrosis of the cells and degeneration occur to such a marked extent in acute yellow atrophy, the formation of connective tissue is absent. The statement may, therefore, be made that, owing to the quick course of the affection, sufficient time is not given for the proliferation of the fibrous tissue. In 1895 Marchand described a case of acute atrophy of the liver in which partial regeneration of the hepatic tissue had taken place. He expressly states that no fibrous tissue was found, though cellulur necrosis had taken place to a large extent. 5. In the passive congestion of the liver due to heart and lung disease, one half the liver cells may have disappeared and the formation of connective tissue be still lacking. The so-called *cirrhose cardiaque* is rare, while the liver due to passive congestion is very common. 6. Autopsy livers are often seen to be markedly degenerated, the process not being acute, and yet no new connective tissue is discovered. 7. Helminthiasis of the liver usually has its seat in the gall-passages and causes the production of connective tissue independently of previous disease of the liver cells. 8. In fibrous perihepatitis (as from

chronic empyema or pyonephrosis), the bands of connective tissue extending into the liver are to be regarded as continuations of the fibrous growths found outside the organ. The appearance is the same as in the classical cirrhosis, without, of course, a primary cell necrosis. 9. The degeneration of the liver cells may take place anywhere in the acini, while the connective tissue formation is found in the periphery of the lobule. 10. Van Heukelom therefore believes that cirrhotic conditions in the liver are not dependent upon parenchymatous (cellular degeneration and necrosis), but that the latter occur sometimes primarily, sometimes secondarily in the course of the cirrhosis. We must not look to alcohol and phosphorus for the direct production of cirrhosis for, considering the large amount of alcohol consumed, cirrhosis is rare. The cause must be sought in the subcutaneous injection of small doses of chloroform, in bacteria and their products, and in many substances which undergo decomposition and fermentation in the intestinal tract. Clinical experience teaches us that disturbances in the alimentary canal exert their greatest influence on the liver, and the school of Hanot have demonstrated that it is anything but a mere hypothesis that cirrhosis of the liver occurs after gastro-intestinal diseases. Alcoholic beverages disturb the digestion, and the complex changes thus induced in the metabolism in the intestinal canal perhaps give rise to the cirrhosis in those who are predisposed to this condition.

CATTELL.

The Mechanism of Reaction to Peritoneal Infection. (*Journal of Pathology and Bacteriology*, March, 1897.) By Herbert E. Durham, Gull Research Student in Pathology, Guy's Hospital, London.

In a communication to the last meeting of the *British Association for the Advancement of Science*, Durham concluded a lengthy paper "On the Mechanism of Reaction to Peritoneal Infection," with the following words; "1. By means of the cellular changes which occur after peritoneal infection in guinea pigs, the following stages may be recognized: *a*, preliminary (lasting to fifth or seventh minute); *b*, leucopenic (lasting to sixtieth minute); *c*, microxyphil and *d*, macrophage (lasting to fourth or seventh day, or even later); *e*, return to the normal. 2. The peritoneal flured, membranes, and lymph paths must be examined in order to obtain complete and accurate knowledge of the processes. 3. The nomenclature megoxyphil cells, or megoxyctes for coarsely granular eosinophil cells, and microxyphil cells, or microxyctes for finely granular eosinophil cells, is suggested. 4. The megoxyctes play a minor part in the process of bacterial destruction, as they may be very scanty during the leurocytolic period. 5. Important changes are observable upon the peritoneal membrane, of which the omentum is especially to be noticed. 6. Pure cellular and pure humoral theories fail to account for many of the phenomena of bacterial destruction in the peritoneal cure. Both are of importance; a compromise between the two

seeming the most satisfactory explanation of facts. Alexocyte theories of secretion, etc., are at present not entirely satisfactory, as all the other possible factors have not yet been eliminated or defined. 7. Extra-cellular degeneration of microbes, especially noticeable in actively and passively immunized animals, and animals to which power of resistance has been given temporarily, can *always* be detected in normal animals, even in the face of the most virulent and toxic infections. 8. The observations of Issaeff on the period of *general increased resistance* are worthy careful notice in discussing the theory of immunity. Issaeff's period of resistance promises to be useful clinically as an aid to the surgery of the peritoneum. 9. The general phenomena of reaction after peritoneal infection resemble those occurring in the blood after intravascular infection, and in connective tissue after subcutaneous infection. 10. After peritoneal infection the general phenomena in rabbits and guinea pigs are not widely dissimilar from those occurring in man.

CATTELL.

The Parathyroid Glands. (Digest in the *Scottish Medical and Surgical Journal*, April, 1897, of the following papers: 1. Sandström "Ueber eine neue Drüse beim Menschen und bei verschiedenen Saugethieren" (Referat in *Schmidt's Jahrb.*, 1880). 2. Gley, *Arch. de physiol. norm. et pathol.*, 1892 (two papers). Gley, *Arch. de Physiol. norm. et pathol.*, 1893 (two papers). 3. Moussu, *Compt. rend.*, N. 29, 1892. 4. Hofmeister, *Fortschr. der Medicin*, Bd. X., 1892. 5. Gley et Physalix, *Compt. rend. de la Soc. de Biol.*, 1893. 6. Kohn, *Archiv. f. mikrosk. Anat.*, Bd. 44, H. 3, 1895. 7. Gley et Nicolas, *Compt. rend. de la Soc. de Biol.*, N. 11, 1895. 8. G. Vassale e F. Generali, *Rivista di Patologia nervosa e mentale*, March and July, 1896. 9. G. Vassale e A. Donaggio, *Rivista Sperimentale di Freniatria*, Vol. XXII., Fasc. 4, 1896, p. 853. 10. Victor Horsley, *Brit. Med. Journ.*, December 5, 1896.) By W. Ford Robertson, M.D., of Edinburgh.

Great interest at the present moment attaches to these small organs in consequence of the very remarkable results of the experiments recently carried out upon them by Professor Vassale, of Modena, and Dr. F. Generali. These observers have demonstrated conclusively that the parathyroid glands in place of being embryonic remnants, as had previously generally been maintained, are organs of vital importance in the animal economy. A new field for physiological, pathological, and therapeutic research has thus been opened up which cannot fail to attract a large number of investigators in the near future, and which may be productive of results of great importance to practical medicine. The parathyroid glands were originally described by Sandström in 1880 as two small epithelial organs lying on either side of the thyroid body in man and several of the lower mammalia. Their structure led him to regard them as residual embryonic thyroids.

No further observations on the subject were recorded until 1892, when Gley again drew attention to it in connection with the results of his experiments upon the thyroid gland in rabbits. At that time the opinion was general that the rabbit tolerates thyroidectomy well, but Gley affirmed that even in this animal the operation was fatal, if care was taken to remove the parathyroid glands at the same time. He stated that if the thyroid alone was removed, the parathyroids increased in size and changed in structure, becoming like the thyroid of the adult. His researches therefore supported the views of Sandström, and led one to consider the parathyroid glands as embryonic material capable of replacing the thyroid. Moussu repeated Gley's experiment on eleven rabbits, but none of them succumbed, and he therefore doubted that the parathyroid glands had the importance that was attached to them by Gley. Hofmeister observed that extirpation of the thyroid body in the young rabbit caused the typical cachexia of chronic course, while contemporaneous albation of the parathyroid glands produced acute symptoms, and a rapidly fatal result. He could not obtain any evidence of the histological transformation of the parathyroid into thyroid tissue in the former case. Immediately after the publication of Gley's paper, Vassale and Generali had instituted a series of experiments with the object of studying the modifications of structure that the parathyroid glands undergo after removal of the thyroid body. They obtained results that were in perfect agreement with those of Hofmeister. Taking into consideration all the known facts, they were led to the conclusion that the parathyroid glands were not residual thyroids, but that they were special organs of the economy, with functions still to be determined, and they set themselves to study the effects of their ablation. They accordingly instituted two series of experiments on cats. In the one they removed the parathyroid glands and left the thyroid. In the other they removed the thyroid body, leaving the parathyroids *in situ* along with a small portion of adjacent thyroid substance, in order, so far as possible, to avoid the risk of interfering with their nutrition. These experiments resulted in death of the animals after several months. Subsequent examination of the tissues led to the important discovery that there are two parathyroids on each side instead of one. The results of these experiments were therefore rendered of uncertain value. Meanwhile Kohn published his accurate anatomical work upon the parathyroid glands. He found that in the dog, cat, and rabbit there were constantly four of these organs instead of two, as had been stated by Sandström. He described two of them as internal (lying close to the thyroid), and two as external. He regarded them as special organs, and not embryonic remnants. Further confirmation of this view was furnished by the later researches of Gley in collaboration with Nicolas, in which they were unable to find any alteration in the parathyroids after removal of the thyroid in rabbits. Having discovered the fallacy entering into their first experimental enquiry into the effects of abla-

tion of the parathyroids, Vassale and Generali instituted a new series of experiments. They extirpated the four parathyroid glands in ten cats and nine dogs. Nine of the cats succumbed within ten days. On the average, they died five days after the operation. They all presented certain definite symptoms, viz., fibrillar contractions, muscular spasms, depression of spirits, rigid and tottering gait, anorexia, tachycardia, rapid emaciation, and lowering of temperature. The remaining cat was still living after six weeks, but it was greatly wasted, and in a state of chronic cachexia. All of the nine dogs died within eight days—on the average upon the third or fourth day after the operation. The morbid phenomena, which began to manifest themselves on the second or third day, were as follows: Depression of spirits, tremors, paralysis of the muscles of mastication, trismus, rigidity of the posterior limbs, unsteady gait, general muscular weakness, slight convulsions, usually just before death; anorexia, vomiting; palpitation, dyspnea; scantiness of urine and sometimes slight albuminuria. The symptoms were therefore very similar to those that follow complete thyroidectomy, which had hitherto, as a rule, really meant removal of the thyroid and parathyroids. They differed, however, in the fact that convulsive phenomena were only very slightly manifested, and generally only towards the end. On the other hand phenomena of diminished excitability of the nervous system predominated, the animals rapidly dying from a condition of paralysis. The authors contend that the symptoms produced by these experiments can only be explained as the result of abolition of the functions of the parathyroid glands. In their second communication they record the results of another series of experiments, which not only thoroughly establish the great importance of these organs, but also serve to throw much light upon a previously obscure point regarding the functions of the thyroid. In these later experiments, which were performed upon dogs, they varied the operation in a number of ways with a view to determining more exactly the respective functional rôles of the thyroid and parathyroids. Some of the more important results that they obtained were as follows: Removal of both parathyroids of one side produced no morbid symptoms in three cases, slight transitory symptoms resembling those following complete ablation of the organs in a fourth case. Extirpation of the two remaining parathyroids of one side a considerable time after removal of those of the other side resulted in the onset of the acute symptoms already described, with death in from five to thirteen days. Ablation of the two internal parathyroids alone produced no morbid manifestations. Subsequent extirpation of the two external parathyroids resulted in death in from three to four weeks. Removal of three parathyroids, an internal one being left, produced only transitory morbid phenomena of the usual character. Subsequent extirpation of the remaining internal parathyroid along with the lobe of the thyroid to which it was attached, resulted in the onset of severe symptoms on the following day and death in about twelve days. Removal of the thyroid lobe

of one side and of the external parathyroid gland of the other side, produced no morbid symptoms. Extirpation of the entire thyroid gland, leaving *in situ* only the two external parathyroids, caused in one case slight temporary morbid symptoms consisting of depression of spirits, anorexia, some rigidity of the posterior limbs and slight muscular spasms. Three other dogs operated upon in the same manner remained perfectly well. Complete removal of the thyroid gland and extirpation of three parathyroids, one external parathyroid being left, caused transient morbid phenomena in one case, no symptoms whatever in another. The authors state that the animals which survived remain under observation, and they promise an extended report of the whole enquiry at a future time. The importance to medical science of the results they have already obtained can scarcely be over-estimated. Their observations indicate that arrest of the functions of the thyroid gland produces only myxedema, and that the acute symptoms that have been found to follow thyroidectomy in many animals are due not to loss of the thyroid but to contemporaneous removal of the parathyroid glands. The subject, it will be recognized, is full of suggestiveness. The question at once arises, Does parathyroid insufficiency ever occur in natural conditions, and, if so, what is the disease produced? A further record of the observations of these Italian workers, and especially of the results of their promised enquiry into the effects of parathyroid feeding, will be awaited with much interest. It may here be added that Vassale aud Donaggio have utilized some of the pathological material obtained from the foregoing series of experiments in an investigation into the changes in the spinal cord resulting from removal of the parathyroid glands. With the aid of special methods they have observed the occurrence of an acute degenerative change affecting the crossed pyramidal tracts, and also, though to a less marked degree, the posterior columns, generally throughout the greater extent of cord. In some instances this change, which they describe as being essentially of the nature of varicose atrophy of the axis-cylinder, was recognizable in animals which had died within three days of the onset of morbid symptoms.

CATTELL.

The Function of the Thyroid Gland. Experimental Cretinism in the Dog, Cat, and Birds. (*C. R. de la Soc. de Biol.*, January 29, 1897.) By Moussu.

As the removal of the thyroid in adult animals is not followed by serious symptoms unless the parathyroid glands are also extirpated, the author undertook to study the effects of its removal on the young; being careful to leave the parathyroid bodies, in order to prevent death. He found that in dogs and cats the development in height was diminished, and the development in breadth was greatly increased; the extremities were very much enlarged, the face wrinkled and the skin underwent myxedematous

degeneration. In a young cock of three months, the same operation produced a complete cretinoid type two months later, with the exception of the myxedema. The animal seemed to lose all energy, even refusing to seek its own nourishment.

SAILER.

On the Presence of Nerves in Tumors and of other Structures in them, as revealed by a Modification of Ehrlich's Method of "Vital Staining" with Methylene Blue. (*Jour. Exper. Med.*, January, 1897.) By H. H. Young, M.D.

After giving the silver method of Golgi a thorough trial with no satisfactory results, it was abandoned in favor of Ehrlich's method of staining living or fresh tissues with methylene blue. Thin layers were cut from the tumors as soon as removed, with the double knife of Valentine, and immediately placed in a solution composed of equal parts of fresh egg albumin, physiological salt solution, one-fourth per cent. aq. sol. ammonium chloride, and a one per cent. aq. sol. of methylene blue. The slides were then placed in a warm, moist chamber and examined at intervals under a low power of the microscope. Differentiation was usually complete somewhere between forty-five minutes and two hours, when the section was placed in the fixing fluid of Bethe and kept at a temperature of 0°C. over night; the tissues were then quickly dehydrated and imbedded in paraffin, and serial sections cut and fixed to the slide. Thirteen tumors in all were examined: four of them carcinomata, three sarcomata, and one an epithelioma. Three of these tumors, among which was an amputation neuroma, were such as would ordinarily be expected to contain nerves, and the other ten belonged to the tumors usually supposed to be nerveless. Distinct axis-cylinders were found sometimes in considerable numbers in no less than five. The largest bundle of nerves was found in a subperiosteal sarcoma of the lower end of the femur and contained about fifty medulated fibres. Regarding the question as to whether the nerves really shared in the proliferation that had taken place in the tumor formation; the author, while conservative, believes that his specimens justify the statement that in sarcomata, there may be nerves that are as much an integral portion of the tumor substance as are the sarcomatous blood-vessels. As to the function of these nerves we can as yet only speculate. In the carcinomata, on the other hand, it is impossible to state positively that any of the nerves present represent a portion of the tumor, *per se*. Methylene blue also stained certain peculiar intra-cellular bodies, which Young includes among the basophilic granules, and which he was surprised to find present in considerable numbers, both in carcinoma and sarcoma. Two types predominate: a form showing long processes into the protoplasm of the cell, and filled with distinct granules taking a deep blue stain; and a round or oval type smaller and taking the stain more diffusely, although apparently gran-

ular when examined with high power. These cells were most frequent about the blood-vessels, but were found also in other parts of the tumor. Besides these it was noted that the red blood corpuscles became polychromatophilic; moreover he found certain bodies that he called cell inclusions; somewhat irregular in shape and taking the stain intensely. The cells in which they were contained differed entirely from the *Mastzellen*, being generally large, swollen, with pale protoplasm and well preserved nuclei. The bodies varied in size from very minute granules, to bodies one-third the size of the nucleus of the cell. Some appear solid, but the majority of the larger bodies are vacuolated, showing an unstained or faintly stained centre, surrounded by a deeply stained irregular peripheral ring. In shape they are spherical, but some of them are oval, or even crescentic or horse-shoe-shaped. Usually from three to five are found in a single cell. Similar solid extra-cellular bodies were to be seen lying apparently free among sarcoma cells. Regarding their nature, nothing is definitely stated. Finally certain fibrillæ seemed to be also basophilic, but were easily distinguished from the axis-cylinders.

SAILER.

The Action of Anti-Ricin. (*Fortschritte der Medicin*, January 15, 1897.) By P. Ehrlich, M.D.

Cobart having already determined that ricin in the living animal and, also, in the extra-vascular blood, produces a peculiar coagulation, it occurred to Ehrlich to study in how far this reaction was influenced by the presence of anti-ricin. The reaction itself consists of the following phenomena: After defibrination the preferably somewhat diluted blood is treated with ricin; the red blood corpuscles immediately unite themselves into little balls which stick together and form a firm united coagulum upon the bottom of the vessels; the liquid above remains perfectly clear. The rapidity with which the reaction occurs depends largely upon the concentration of the solution of ricin; and, according to Ehrlich, is a purely chemical precipitation entirely independent of any vital process. The following experiments are described with 95 c.c. of the physiological sodium chloride solution, to which a little of a five per cent. sodium citrate solution had been added; five c.c. of rabbit blood were mixed; ten c.c. of this mixture was treated with one c.c. of twenty per cent. solution ricin; typical coagulation phenomena occurred very rapidly. One c.c. of the ricin was now mixed with various quantities of anti-ricin .3, .5, 0.75 c.c., etc. The first test with this mixture of anti-ricin and ricin produced a precipitation as before. In the second test, where the anti-ricin was present in a slightly larger amount, the coagulation was somewhat delayed. In the third test it occurred in twelve minutes. In the tubes to which a larger proportion of anti-ricin has been added nothing occurred during the first hour, after 24 hours there was a slight precipitate in the fourth tube; nothing at all

in the fifth and sixth. In order to test whether this interference with the mechanical activity of ricin was equally efficient in preventing the pathogenic effect, six mice were injected with a solution which had been already prepared. Of these the latter three were not affected, the first two died at different intervals; and the third showed slight induration with loss of weight and apparent sickness. Ehrlich therefore concludes that at least for ricin and anti-ricin, it has been proved that they act upon one another in a purely chemical manner.

SAILER.

Local Action of Eel Serum and Serum Therapy Against Its Toxic Effects. (*C. R. de la Soc. de Biol.*, January 29, 1897.) By Hericourt and Richet.

The first result of the injection is the production of considerable local pain. At the end of 24 hours the region becomes swollen, edematous, and there is considerable accumulation of liquid. In some cases there is intense suppuration with gangrene and separation of the gangrenous portion, although in other cases there is simply the congestion and edema without the suppuration. Even with the smallest dose, the local pain may persist for several days. These local effects seem to occur whether the animal has been rendered immune to the general toxic effects or not. If a dog is injected with eel serum, his own blood becomes antitoxic and is capable of preventing the appearance of toxic symptoms in rabbits. In order to prove this point the authors first determined the lethal dose of the serum and found that in a rabbit of two kg., one c.c. made the animal very sick; two c.c. killed it in four or five minutes; and three c.c. caused death in less than a minute. Nine rabbits were then taken; the evening before the experiment three received five c.c. of the serum of a normal dog; three received each five c.c. of the serum of a dog that had been inoculated a week previously; three others were kept as control animals. The next day each of the animals received an intravenous injection of eel serum, diluted in ten times its volume with artificial serum. The three control animals died at once; of the three injected with the serum of the normal dog, two died at once and one after a few hours; the three animals rendered immune not only did not die, but were not even made ill.

SAILER.

The Differentiation of Diphtheria and Pseudo-diphtheria Bacilli. (*Centralbl. f. Bakt., Parasit. u. Inf'kr.*, January 30, 1897.) By Dr. de Martini.

The author has endeavored to find some satisfactory method for differentiation of diphtheria bacillus from pseudo-organisms. He finds that in fluid antitoxic serum the true diphtheria bacilli do not grow, nor do non-virulent pseudo-bacilli that render bouillon acid; whilst avirulent organ-

isms, that render bouillon alkaline, grow equally well in liquid antitoxic serum and normal serum. All forms grow excellently upon antitoxic serum that has been coagulated at 70°.

SAILER.

The Poison of the Honey Bee. (*Archiv. f. exper. Path. und Pharmak.*, February 25, 1897.) By Josef Langer.

Sacrificing altogether about 25,000 bees, the author has reached some positive conclusions regarding the nature of the poison, although he has not been able to isolate it entirely. He obtained the substance in three ways: If a bee is carefully held between two fingers and then slightly irritated, it protrudes its sting, on the end of which a drop of poison appears, and this may be caught in a few drops of distilled water, in which it is readily and completely soluble; or the bee may be permitted to sting through filtered paper, or the entire poisonous apparatus may be removed and placed in alcohol, in which the poison is insoluble, dried, powdered, and extracted with distilled water. As a physiological test he used the conjunctiva of rabbits, which is extremely sensitive, and in which simple instillation produces the full toxic reaction. The poison presents the following qualities: A fresh drop is clear, acid, bitter and exhales an aromatic odor. When dried it leaves a sticky deposit somewhat resembling gum arabic. The specific gravity is 1.1313. The amount of residue is 30 %, and this contains all the poisonous properties. The weight of a drop derived from a single bee varies between .0002 and .0003 grammes. The acid element gives all the characteristic reactions of formic acid and is evidently not the active poisonous principle. The secretion contains no bacteria. Mixed with bacteria upon agar and in bouillon it hinders their growth, but does not destroy either their virulence or their vitality. When the poison is boiled it becomes cloudy. With Millon's reagent there is a red precipitate. The biuret reaction is positive. Trommer's test is negative; it contains HCl, phosphoric acid, sodium, and calcium. The toxic constituent is very resistent; it is not destroyed by boiling, and in sealed glass tubes shows full activity after six months. If, however, it is exposed to the air, it loses its virulence in about four weeks. Putrefaction in the solution completely destroys its activity. It was possible, by making use of the poison apparatus of 1,200 bees to obtain a considerable quantity of this substance, which, after repeated washing, was precipitated upon the bottom of the vessel as a flaky material. This showed a distinct albuminous reaction, but as the toxic action did not always correspond to the amount of albumin present, it was suspected that the poison itself was not of this nature, and in fact it was possible to obtain a filtrate which gave no traces of the biuret reaction, but was nevertheless actively virulent. This solution tested in various ways seemed to indicate that the active principle must be considered as a base, but a more accurate differentiation could not be made.

Physiologically this poison produced locally necrosis, with round-celled infiltration, edema, and hyperemia. Injected intravenously into a dog, it caused death with clonic spasms, trismus, nystagmus, and emprosthotonos. At the autopsy there was a bloody serous exudate in the pericardial sac; multiple infarcts in the lung and kidneys, and hemorrhagic infiltration of the pancreas and mesenteric lymph glands, characteristics which resemble very closely those of the poison of the rattlesnake and viper.

SAILER.

Anti-Tuberculous Serum and its Antitoxin. (*Rev. de la Tuberculose*, Paris, July, 1896.) By Prof. C. Maragliano, of Genoa.

If cultures of tuberculosis be taken and concentrated at 100° C. then filtered through Chamberlaind's filter; or filtered at 37° C. and then concentrated in a vacuum, the two preparations will show markedly different physiological results. In the former are collections of toxic materials which come from the body of the bacilli, the proteids. In the second are found the secretions of the bacilli, the toxalbumins, which are readily destroyed by heating. The latter, injected into tuberculous animals, produce hypothermia and, into a tuberculous man, hypothermia and sweating, that is the action is diametrically opposed to that of tuberculin. In order to produce the antitoxin, a mixture is made of three parts of the extract of the proteids and one part of the toxins, both being concentrated to a degree that one c. c. kills 100 grammes of healthy guinea pig. Of this mixture 2 mg. per kg. of animal is first injected and the dose gradually increased from day to day, until 40 or 50 mg. per kg. are employed. After this the same quantity is daily injected and at the end of six months the blood contains a sufficient quantity of antitoxin. This blood will protect a healthy guinea pig against mortal doses of tuberculous proteids and it will protect tuberculous guinea pigs against mortal doses of tuberculin. Naturally these results are somewhat variable, that is, the minimum quantity sufficing to produce protection is not the same for all tuberculous animals. Nevertheless, it is always possible to obtain protection by increasing the dose. In tubercular men it is possible with this antitoxin to prevent the development of fever when tuberculine is injected. In vitro the serum is bactericidal; if the bacilli of tuberculosis are inoculated into two specimens of serum that have been heated to 50°, one coming from a horse that has been previously inoculated with the toxin of tuberculosis, and one from a normal horse, the culture will develop in the latter, but not in the former. In order to obtain an estimate of the curative power of the serum, Maragliano tested it upon guinea pigs and found that, in general, one c. c. will protect one kg. of guinea pig against the minimum lethal dose of tuberculin. In a subsequent communication the author promises to publish the results of his experiments concerning the cure of tuberculous animals with the serum.

SAILER.

Researches Upon the Changes Produced by Intra-Pericardial Compression of the Heart. (*C. R. de la Soc. de Biol.*, January 29, 1897.) By Francois Franck.

If the heart is isolated and normal serum set flowing through it at a certain pressure, whilst a slightly higher pressure is maintained in the pericardial sac, the radial pulse is suppressed, apparently as a result of the compression of the auricles and the consequent obstruction to the passage of the liquid into the ventricular cavity. If, however, the pressure of the liquid circulating in the heart, be elevated to that in the pericardium, the circulation is at once reëstablished. If, however, the heart is not isolated and therefore the venous pressure be subject to variation and increase, any intra-pericardial pressure causes only a temporary fall in the arterial pressure and the suppression of the ventricular wave. This can be explained by the reflex elevation of the intra-venous pressure, so that, in time, it overcomes the tension of the liquid in the pericardium. If the animal breathes spontaneously, it is necessary to make use of an extremely high intra-pericardial pressure in order to abolish the pulse. In this case dyspnea is an active element in the defence of the system against the influence of intra-pericardial pressure, causing a great increase in the thoracic aspiration and, as a result, decrease of the intra-pericardial pressure, thereby aiding considerably in the onward movement of the blood.

SAILER.

The Soluble Toxin of Typhoid Fever. (*C. R. de la Soc. de Biol.*, January 29, 1897.) By Chantemasse.

As it is necessary to possess the toxin in soluble form, in order to obtain the antitoxin of typhoid fever, the author undertook to obtain this substance. Unfortunately, this toxin is not developed in the ordinary bouillon cultures, or else, is present in such small quantities that it is of no value. He observed, however, that the typhoid bacillus maintains its vitality longest in the marrow of bones, and a medium was prepared from macerated spleen and bone marrow, to which a small quantity of defibrinated human blood was added. If the virulent organism is inoculated upon this medium it grows very rapidly, and after the medium has been filtered through porcelain it is found to maintain its toxicity. This substance is very difficult to preserve. It loses its virulence upon contact with air and with the light; it becomes attenuated at the temperature of 0°C.; but shows considerable resistance to heat, exposure to a temperature of 58° for an hour having apparently no effect. If the lethal dose is acidulated with tartaric acid, it loses the greater portion of its power, but this reappears as soon as the reaction is once more made alkaline. It is more active when injected into large animals, than when injected into the smaller rodents.

SAILER.

PEDIATRICS.

Communication on the Pathology of Whooping Cough. (*Jahrbuch für Kinderheilkunde*, Vol. XLIV., No I., p. 53.) By J. Fröhlich, M.D.

The cases utilized in these studies were only those which at some period showed the typical paroxysms of pertussis. In the intervals between the attacks the patients were almost free from cough. The lung examinations were negative or showed only bronchitis. There was no fever. The cough in all cases existed from at least eight to ten weeks. The patients were seen in the attacks before a diagnosis was made. The blood of 55 cases was examined in regard to the number and form of the white blood corpuscles. In counting the Thoma mixing pipette was used diluting to one to ten or one to twenty with a one-third per-cent. acetic acid solution. Where high leucocyte values were expected the pipette modified by Rieder was used diluting to one to forty. For staining, Ehrlich's tri-acid mixture was employed. The results showed that in pertussis a leucocytosis usually exists, in some cases of very high value. The latter was especially observed in cases examined in the third and fourth weeks, at the period when the paroxysms were most severe. From the fact that patients examined before and after this period showed a less leucocytosis, Fröhlich concluded that the augmentation of the white blood corpuscles occurred with the increasing intensity of the attacks and with the lessening of the same gradually decreased again. Patients suffering from diseases which of themselves gave rise to a leucocytosis, were excluded in this series. In order to avoid the digestion leucocytosis all examinations were made before the mid-day meal. The difference in the degree of leucocytosis in the individual cases is not satisfactorily explained. There seemed no relation between the other symptoms, the number and severity of the attacks, the appearance of complications, and the height or lowness of the number of leucocytes. F. considered it possible that the difference might depend upon a greater or less susceptibility of the individual or upon a difference in quantity of the poison circulating in the body. In confirmation of the former he found that in different animals a different degree of leucocytosis appears when one injects into them the same quantity of the same leucocyte-producing substance. He proved that the leucocytosis depends upon a true increase of the white formed elements in the blood and not upon changes which could have affected the whole quantity of blood. This leucocytosis is quite in accord with the increased uric acid excretion in pertussis as shown by Blumenthal, the decrease of the nuclein rich leucocytes giving rise to the uric acid surplus. There exists a relatively great number of lympocytes amounting in some cases to fifty or sixty per cent., while in ordinary forms of leucocytosis they are only fifteen to twenty-five per cent. This is probably not so much dependent upon the disease itself as upon the fact established by Weiss, that in

childhood the number of lymphocytes far outweighs the number of polynuclear cells. It is probable that the leucocytosis is dependent upon certain substances circulating in the blood-vessels which cause an increased expulsion, a washing out of the leucocytes from their place of origin. The existence of leucocytosis in pertussis enables one to differentiate it from other diseases accompanied by similar paroxysms of cough. F. gives a series of six cases which were presented as cases of whooping cough in which the blood examination showed no increase in the number of leucocytes. The further history of these cases showed them not to be pertussis. The recognition of a leucocytosis is especially valuable in those cases in which the attacks are not typical and in those cases of simple bronchitis accompanied by paroxysms of cough of a pertussoid type. The existence of a leucocytosis further confirms the theory of the infectious nature of the disease.

S. M. Hamill.

Scarlatina with Eruption limited to the Face. (*Le Progrès Médical*, February 6, 1897.)

Lemoine reported to the *Société Médicale des Hôpitaux* on January 29, 1897, 23 cases in which the eruption was exclusively limited to the face. He referred to cases of a similar nature recognized by Braun as an epidemic in adults in Fürth in 1840. That the cases were scarlet fever was established by the fact that typical cases occurred subsequent to these irregular cases. The patients presented themselves to the hospital suffering from an angina, with fever and redness of the face. The fever fell, but the redness continued, and was shortly followed by a more or less abundant desquamation. A few of the cases afterwards developed albuminuria, anasarca, and symptoms of uremia. He considered that the cases formed a transition stage between the anginoid scarlatina and scarlatina with general eruption.

S. M. Hamill.

Transmission of Scarlatina by Means of a Letter. (*Ann. d'Hygiene Publique*, Vol. XXXIV., and *Central. f. Bakt., Parasitenkunde u. Infectionskrankheiten*, January 9, 1897.) By Grasset.

The author reports a case of scarlatina in a boy of two and a-half years, living in a district which had been free from scarlet fever for years. Investigation showed the source of infection to be a letter, received six days before the boy sickened, from the grandparents, announcing that a child living with them was convalescent from scarlet fever, and "shedding her skin like a snake." A few pieces of skin were enclosed in evidence. The letter and its contents were used as a plaything by the boy until the day he sickened, and evidently caused the disease. Grasset refers to a report by Laurie of a German woman who wrote during convalescence from scarlet

fever to two friends in France. Both of them developed the disease and died. S. M. HAMILL.

Tuberculosis of the Tonsils in Children. (*Berliner Klinik*, 1896, and *Centr. f. Bakt., Parasitenkunde u. Infectionskrankheiten*, January 9, 1897.) By Schlesinger.

S. examined the tonsils post-mortem in seventeen cases of tuberculosis. In thirteen cases of phthisis florida which were associated with slight cheesy pneumonia and cheesy peri-bronchitis, there were twelve with tonsilar tuberculosis. In four cases of old pulmonary tuberculosis with old cheesy foci or with intestinal or joint tuberculosis, the lungs being free, there were no tuberculous changes in the tonsils. Thus the author established for children the same parallel between lung and tonsilar tuberculosis as exists for adults. "Pulmonary phthisis is almost always accompanied by tonsilar tuberculosis and conversely in tonsilar tuberculosis pulmonary tuberculosis is never wanting. In mild tuberculosis of the lung or especially in cases of healed foci the tonsils are free from tuberculous changes."

S. M. HAMILL.

I. Pemphigus Neanatorum. (*Zeitschr. f. Medizinalbeamte*, 1896, No. 22, and *Centralb. f. Bakt., Parasitenkunde u. Infectionskrankheiten*, Band XXI., March 5, 1897.) By Dr. Vogel.

II. An Endemic of Pemphigus Neanatorum. (*Ibid.*) By Kuhnt.

I. Vogel observed this condition in four children born one after another in the course of fourteen days. The same midwife conducted each of the four labors. Children born during the same period in the same community and attended by another midwife were healthy. The author attributes the origin of the disease to the midwife for three reasons: 1. Because the cases occurred only in her practice in four successive cases under her care. 2. Because new cases ceased to appear when she was forbidden to practice for several weeks and her instruments and clothing were disinfected. 3. Because the parts of the skin at first and by preference were affected, which the midwife in the cleaning of the child chiefly fixed, the chin in drawing back the head to clean the neck and the region of the navel in taking care of the cord.

II. Kuhnt communicates an endemic occurring in the practice of a midwife. She conducted 28 labors in a period of six months. Eleven of the children, entirely healthy at birth, were attacked with pemphigus. Four of the eleven died. Investigation showed that the midwife had bathed and been associated with the sick children and that she had gone to new cases wearing the same dress and apron and had wrapped the babes in the apron which shortly before had covered the infected children. She was put out of service for some weeks, herself, her clothing, and instruments were cleaned and disinfected. No cases were observed when she resumed her practice. Mothers, brothers, and sisters, who had waited

upon the sick children, were attacked by pemphigus. The midwife remained healthy.

Fatal Bleeding from the Internal Carotid in Consequence of an Erosion from a Carious Process. (*Wiener klinische Wochenschift*, March 4, 1897.) By Dr. Panzer.

Panzer reported the case of a child of two and a-half years, who was brought to the Clinic on account of profuse bleeding from the right ear. The child had had a purulent discharge from the ear for two years, and eight months previously had had some polypi removed from the same ear. The bleeding began spontaneously. It was checked by tampon. The child was so anemic, and its pulse so weak that operation was out of the question and it was not considered advisable to remove the tampon. In the afternoon a colossal hemorrhage from the ear, mouth, and nose resulted fatally. *Autopsy.*—There existed in the dura mater, in the cerebrum and cerebellum everywhere scattered solitary tubercles even to the size of a pigeon egg. The dura mater was everywhere glossy and colored bluish over the petrous portion of the temporal bone on the right side. The transverse sinus was free. Corresponding to the bluish colored area the dura showed on its outer surface exuded matter and blood clots. Nearly the entire upper surface of the petrous portion of the temporal bone was destroyed by the carious process, which process extended to the whole tympanic cavity to the bony auditory canal, also to the squamous portion of the bone. The sinus was not the source of the bleeding. Just at the point where the perpendicular portion of the internal carotid sinks into the horizontal, corresponding to the lower anterior wall of the tympanic cavity, an opening, about three mm. in circumference, which communicated freely with the cavity and through which the blood proceeded, was discovered. Panzer considers these cases unusual, thirteen were collected by Hessler in 1884. This case is the youngest recorded.

S. M. Hamill.

OBSTETRICS AND GYNECOLOGY.

Puerperal Fever Treated by Anti-Streptococcic Serum followed immediately by Enteric Fever; Recovery. (*Br. Med. Journ.*, December 26, 1896.) By James Adam, M.D.

The patient, a primipara, was delivered with forceps; the perineum was torn into the rectum, but not stitched; no douche was given. On the 6th day the temperature rose and Adam was called in the following day. From the 7th to the 11th day the temperature fluctuated between 104° F. and 105° F. and the pulse was rapid, the tongue dry, there was loss of flesh, the lochia were suppressed, and there was diarrhea. On the evening of the 11th day, the temperature being 104° F., 5 c. cm. of serum were injected as an initial dose.

During the next 12 days 102 c. cm. were administered in doses varying from 4 to 17 c. cm., 10 c. cm. being the usual dose. The temperature gradually fell with many exacerbations to 99° on the 23d day, after which it began to show the characteristic rise of typhoid fever. The rash appeared on the 28th day and the fever ran its course, ending in recovery. Serum from both the Pasteur Institute in Paris and the Bacteriological Institute in Lyons were used, and a comparison of the effects in reducing temperature shows that the more expensive Lyons serum was much more powerful. (This clinical fact coincides with the experiments of Merieux and Niemann, reported in the *Berl. klin. Wochenschrift*, December 7, 1896.)

L. S. Smith.

I. Vaginal Hysterectomy by the Clamp Method. (*Centralblatt für Gynäkologie*, January 23, 1897.) By Dr. M. Sänger.

II. Methods of Vaginal Hysterectomy; Clamps or Ligatures? (*Centralblatt für Gynäkologie*, January 23, 1897.) By Dr. A. Döderlein.

I. Sänger follows the technique of Jacobs—the Pean-Segond method without *morcellement* but with the median incision of the uterus according to Doyen. By the complete disregard of hemorrhage until after the fundus has been dragged down and out, the technique is greatly simplified and the time of operation is much shortened. He removes the forceps after 48 hours, taking care not to disturb the gauze packed in the vagina, while the gauze itself is allowed to remain 8 days, or even longer if no alarming symptoms of peritoneal or intestinal disturbance occur. Should such trouble arise within a few days after operation, then the removal of the gauze becomes a very important question, and careful judgment is required to decide whether the presence of the packing is worse for the patient than the risk of a vaginal hernia if it is removed too soon. For the first two days after operation most patients show the usual reaction following any vaginal operation, but their extremely sick appearance lasts longer and their discomfort is increased by the rigidly enforced dorsal position necessitated by the forceps. The febrile reaction is most marked when the adnexa as well as the peritoneum have been found to be perfectly sound. The first flatus is passed usually later than after a celiotomy, but convalescence is quite rapid and the patient is able to leave her bed on the 10th or 12th day. In 44 cases there were 6 deaths—not a very brilliant record if we include the 4 deaths following the 8 myomo-hysterectomies. These occurred on the 4th day from acute cerebral disease, on the 22d day from iodoform poisoning, on the 18th day from ileus, and on the 5th day from sepsis. Sänger concludes that except for pelvic abscesses and malignant disease of the uterus the disadvantages of the clamp method outweigh the advantages, so he advocates and practices the use of both ligatures and forceps, substituting the former for the latter before completing the opera-

tion, in all except these two classes of cases. The fact that it is possible often to apply the forceps and remove tissue in a position inaccessible to a ligature, owing to the lack of space in which to work, fits the forceps operation to cases of malignant disease. In pelvic abscesses the opening in the vaginal vault must be left open for drainage so, if a hysterectomy is done, the forceps left in place do not interfere with the recovery.

II. This article by Döderlein embodies the results of 39 complete vaginal hysterectomies, 12, all of which the patients recovered. The first 16 of the series were done by the original Czerny's method (with ligatures), which proved perfectly satisfactory except for cases of pyosalpinx. In some of these cases the adhesions and inflammatory infiltration of the tissues render the application of the necessary ligatures almost impossible, but offer little or no hindrance to the use of the forceps. Pus tubes larger than the first the author would remove by the abdominal method, on account of the universal adhesions that always complicate these cases. Smaller and, as a rule, less firmly adherent tubes he prefers to remove *per vaginam*. 22 cases were operated upon with forceps alone, and one case with a combination of both forceps and ligatures. He finds the technique greatly simplified by the forceps, and would adopt it in all suitable cases were it not for the increased discomfort to the patient, the delayed convalescence and the increased liability to septic infection through the open wound in the vagina. The pain after the operation in which the use of ligatures permits the closure of the vaginal wound usually passes off the second day, but by the other method the two days' "torture" of the instruments in position with the pain of their removal and that of the gauze later, tends to unnerve the patient. He lays especial stress on the suffering caused by the removal of the forceps even when done with all possible care by one who has had considerable experience. These disadvantages lead him, in the interest of his patients, to substitute ligatures and closure of the wound in all cases in which the placing of the ligatures is not rendered too difficult by the inaccessibility of the parts.

L. S. Smith.

MISCELLANEOUS.

The Prevention of Propagation of Kind.

Dr. W. R. Edgar, a Representative in the Michigan Legislature, has introduced "A bill to provide restrictions relative to persons, inmates of certain State institutions, that such inmates shall cease to be reproductive, and providing rules and modes of procedure to restrict the propagation of kind."

Section 1. The people of the State of Michigan enact: That all persons, inmates of the Michigan Home for the Feeble Minded and Epileptic, and all persons who shall hereafter become inmates of said Home for the Feeble Minded and Epileptic, shall each and every person confined in said

institution, before he or she is discharged, be caused to submit to an operation causing asexualization, that such persons shall cease to be able to reproduce their kind.

SECTION 2. All persons who shall have been convicted of a felony a third time and so stated by the court, the first or second conviction having been committed in this State or some other State of the United States, upon conviction and sentence to a Michigan State prison, at a time prior to the expiration of such known third sentence, shall be caused to submit to an operation that causes asexualization and stops their ability to reproduce their kind.

SECTION 3. The superintendent, warden, or other person having charge of such Home for the Feeble Minded and Epileptic and such prisons as shall contain the persons as provided for in sections 1 and 2 of this act, shall cause the medical superintendent in charge of said institution to perform such operation, or if from inability the medical superintendent be debarred at the time from carrying out such operation, he may call to perform or assist in the performance of the same, any physician or surgeon of this State. The superintendent, warden, or other person in charge of said institution may pay to such operator a sum of not more than twenty-five dollars for each and every operation so performed, and in no case where the operation is performed by the physician employed regularly by the within named institution shall there be paid any extra compensation.

SECTION 4. In each and every case, before such operation shall be performed, if the person be feeble minded or an epileptic confined within a prison in this State, the matter shall be presented to the board of control of such institution in writing, wherein it shall be shown that such operation would benefit the subject physically and morally, or that it is necessary as a restrictive measure to prevent propagation of kind in case the subject is discharged from the institution. The board of control shall, after being satisfied of the advisability of such operation, authorize the medical superintendent to perform the same, after first giving notice in writing to the parents or guardians of such person at least ten days before such operation.

SECTION 5. It shall be the duty of the judge passing sentence upon whomsoever shall have been convicted of the crime of having ravished a child or woman while upon the streets of any city, village, public highway or any other place within this State, to include in such sentence that within one year after being confined in such prison, an operation which causes asexualization shall be performed as provided in sections 3 and 4 of this act.

SECTION 6. Non-compliance with this act shall be just cause for removal and forfeiture of the position of such superintendent, warden, or other person named in this act.—*The Physician and Surgeon*, March 18, 1897.

The Relation of Impure Water to Disease.

A discussion upon impure water was held at the annual meeting of the Medical Society of the State of New York, on January 28, 1897. It was organized by Dr. Henry Hun, who rightly considered that, as the water supply is a subject of anxious consideration in most of our cities, a review of the many important and well-established facts which the investigation of this subject for the past twenty years has demonstrated would be of practical use. The papers read at this meeting are published in a special double number of the Albany Medical Annals, and from them we have selected the following extracts :

Among the sources of contamination of water, attention is called to the apparent innocence of water derived from uninhabited regions as compared with that from inhabited tracts. This is due to the fact that the great majority of pathogenic bacteria which gain entrance to water are voided from the system with the bowel discharges and conveyed by the sewage to the water.

Of the so-called water-borne diseases, malaria and amebic dysentery, which are caused by animal organisms, give very unsatisfactory evidence of water transmission, inasmuch as the organisms causing these diseases have never been isolated from water and their natural habitat is unknown. The diseases which have been most conclusively shown to be, at least sometimes, transmitted by water, belong to that class due to vegetable organisms, and are typhoid fever, cholera Asiatica, and certain diarrheal diseases.

The close connection between the character of the drinking water and the mortality from typhoid fever is clearly shown by statistics from different cities. Of our American cities, Brooklyn gave the lowest death rate from typhoid fever during the last census year. Chicago, until 1892, had the highest annual death rate from this disease of the seventeen principal cities of the United States. This city drew its drinking water from Lake Michigan, which was polluted by sewage from the Chicago river. In 1892, two four-mile tunnels were made out into the lake, and later two more were added. The effects of pure water are shown by a comparison of the annual death rate in 1892, which was 11.5 (per 10,000 of population), with that of 1894, when it had fallen to 3.1.

The methods of water purification were discussed at some length by Thos. B. Carpenter, M.D. The filtration of water by methods which simulate closely the natural percolation of water through the superficial layers of the soil seems to be the most efficient. This is effected by the sedimentation of the water in basins to remove the grosser particles and subsequent filtration through beds of sand. A large number of such are in existence, and are confined mostly to Europe where greatly polluted streams render it imperative that efficient methods of purification be practiced. Mechanical methods of filtration have received much attention of

late because they can be operated and constructed cheaper than natural filterers. These filters are of two varieties, the "gravity," in which the sand is placed in wooden tanks into which the water is pumped for filtration, and the "pressure" which has closed steel tanks placed in the direct main service. Satisfactory comparisons of the work done by natural and mechanical methods cannot be made at present, because sufficient data regarding mechanical filtration is not obtainable; but from statistics at hand, as given by cities using mechanical filters, the typhoid death rate has not been reduced to the extent that it has in cities using natural methods.

F. C. Curtis discussed the life history of the typhoid germ. He believes that in the soil this germ finds an environment where it may remain vital for an indefinite length of time; and that, as universally agreed, it becomes more active when the ground water is low and is then conveyed to streams and wells and in this way and in no other causes an increased prevalence of the disease.

John S. Ely contributed an article upon the efficiency of bacterial and allied tests in the diagnosis of typhoid fever. He concludes that the great difficulty attending the detection of the typhoid bacillus in cases of typhoid fever renders this test of little diagnostic value. The two indications found in the blood of typhoid patients, namely, the absence of leucocytosis and the remarkable power of the blood upon the bacteria of typhoid fever, causing them to agglutinate and inhibiting their motility, promises to be of more practical diagnostic value. The question of the serum test cannot be definitely answered, however, until a large number of observations have been made, noting the occurrence of the reaction in typhoid fever and also in other diseases and in health. PECKHAM.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,

Of the Philadelphia Bar.

SKIAGRAPHS PRODUCED BY THE RÖNTGEN, OR X-RAY, PROCESS AS EVIDENCE.

THE question of admitting in evidence the skiagraph, or photograph, produced by the Röntgen, or X-ray process, came for the first time, so far as known, before a District Court in Colorado; and it was admitted as secondary evidence upon the same ground on which maps and drawings are admitted.

The skiagraphs in this case,[1] were offered to show the condition of the head and neck of the femur; but this offer was objected to, the defendant's counsel contending that, inasmuch as they are alleged to be photographs of

[1] Smith *vs.* Grant, 29 Chicago Leg. News, 145 (1896).

an object unseen by the human eye, there is no evidence that the photograph accurately portrays and represents the objects so photographed.

In this connection, it may be profitable to recall that the same objection was raised when photographs were first offered as evidence; but it was judicially determined that they are admissible on questions involving the identity of persons or things, comparison of handwriting, records and the like, as secondary evidence, where the primary and better evidence is not obtainable. Indeed, the safe rule deduced from all the decisions is, that photographs are never admitted but as secondary evidence; and, for this purpose, a foundation must be laid as in other cases where secondary evidence is offered, that is to say, the absence of the primary and better evidence must first be proved.

In one case in which a photograph was introduced to prove the identity of the deceased with the original of the photograph offered in evidence, the Supreme Court of Pennsylvania, in the year 1874, said: "It is evident that the competency of the evidence in such a case depends on the reliability of the photograph as a work of art, and this, in the case before us, in which no proof was made by experts of this reliability, must depend upon the judicial cognizance we may take of photographs as an established means of producing a correct likeness. The Daguerrean process was first given to the world in 1839. It was soon followed by photography, of which we have had nearly a generation's experience. It has become a customary and common mode of taking and preserving views as well as likenesses of persons, and has obtained universal assent to the correctness of its delineators. We know that its principles are derived from science; that the images on the plate, made by the rays of light through the camera, are dependent on the same general laws which produce the images of outward forms upon the retina through the lenses of the eye. The process has become one in general use, so common that we cannot refuse to take judicial cognizance of it as a proper means of producing correct likenesses."

And in the year 1881, the New York Court of Appeals, in a case in which photographs were offered to show the change in the appearance of a boy towards whom the defendant was charged with cruelty, said; "We know not of a rule applicable to all cases, ever having been declared, that photographs are not competent. Nor do we see, in the nature of things, a reason for a rule that they are never competent. We do not fail to notice, and we may notice judicially, that all civilized communities rely upon photographic pictures for taking and presenting resemblances of persons and animals, of scenery and all natural objects, of buildings and other artificial objects. It is of frequent occurrence that fugitives from justice are arrested on the identification given by them. So the signs of the portrait and the photograph, if authenticated by other testimony, may give truthful representations. When shown by such testimony to be correct resemblances of a person, we see not why they may not be shown to the triers of

the facts, not as conclusive, but as aids in determining the matter in issue, still being open, like other proofs of identity or similar matter, to rebuttal or doubt."

And the Supreme Judicial Court of Massachusetts, by Chief Justice Gray, said that the photograph must be verified by proof that it is a true representation of the subject, and that whether it was sufficiently verified was a preliminary question of fact to be decided by the judge presiding at the trial, and not open to exception on appeal.

In overruling the objection made to the offer of the skiagraphs in evidence in the present case, the trial judge said:

"We, however, have been presented with a photograph taken by means of a new scientific discovery, the same being acknowledged in the arts and in science. It knocks for admission at the temple of learning, and what shall we do or say? Close fast the doors or open wide the portal?

"These photographs are offered in evidence to show the present condition of the head and neck of the femur bone, which is entirely hidden from the eye of the surgeon. Nature has surrounded it with tissues for its protection, and there it lies hidden; it cannot by any possibility be removed or exposed that it may be compared with its shadow as developed by this new scientific process.

"In addition to these exhibits in evidence we have nothing to do or to say as to what they purport to represent; that will, without doubt, be explained by eminent surgeons. These exhibits are only pictures or maps, to be used in explanation of a present condition, and therefore secondary evidence and not primary. They may be shown to the jury as illustrating or making clear the testimony of experts. The law is the acme of learning throughout all ages. It is the essence of reason, wisdom, and experience. Learned priests have interpreted the law, have classified reasons for certain opinions which in time have become precedents, and these ordinarily guide and control, especially trial courts. We must not hedge ourselves round about with rule, precept, and precedent until we can advance no further. Our field must ever grow as trade, the arts, and science seek to enter in.

"During the last decade, at least, no science has made such mighty strides forward as surgery. It is eminently a scientific profession, alike interesting to the learned and unlearned. It makes use of all science and learning. It has been of inestimable value to mankind. It must not be said of the law that it is wedded to precedent; that it will not lend a helping hand. Rather let the courts throw open the door to all well-considered scientific discoveries. Modern science has made it possible to look beneath the tissues of the human body, and has aided surgery in telling of the hidden mysteries. We believe it to be our duty in this case to be the first, if you please to so consider it, in admitting in evidence a process known and acknowledged as a determinate science. The exhibits will be admitted as evidence."

BOOK REVIEWS.

HUMAN ANATOMY, GENERAL AND DESCRIPTIVE FOR THE USE OF STUDENTS. By John Cleland, M.D., LL.D., D.Sc., F.R.S., Prof. of Anatomy in the University of Glasgow and John Yule Mackay, M.D., C.M. Prof. of Anatomy in University College, Dundee. The Macmillan Co. 1896. 833 pp. Cl. $6.50.

The present volume by Cleland and Mackay adds one more to a remarkable list of works on anatomy by men whose names are famous in the annals of Scotland. It is a worthy successor of the works of the brothers Bell, the two Monros, MacAlister, Maclise and McClellan, Alec Fraser, and we will not venture to say how many others. It is a handsome volume containing 630 illustrations, a large number of which are colored, and including 257 which are printed for the first time. About half the drawings are by Dr. Cleland. In the section on the skeleton, photography has been employed freely; in the section on the muscles the illustrations have been taken, with due acknowledgments in all cases, from the magnificent work of Testut. The illustrations of the skull are excellent specimens of photography but in the case of many of the bones, like the sphenoid and temporal, there is lacking that quality of relief which, to the student for whom the book is intended, is necessary to bring to mind all the landmarks. Well executed drawings are introduced freely to supplement in a measure the requirements of the case. The illustrations showing the arteries and veins are handsome, and are quite largely from Testut's work.

The strong point of the work is the thorough discussion of the subject from an embryological and histological standpoint. All the latest researches have been utilized in this department and photographs of microscopic sections introduced. The last chapter on the utilization of the Röntgen rays in the study of anatomy is another evidence that the treatise is up to date.

Of all the medical sciences anatomy is the one which is founded on the surest basis, admitting of very little discussion or speculation. Anatomical discoveries are not wrapped in the swaddling clothes of hypothesis at birth. A contribution to anatomical knowledge is accepted as soon as enunciated and it takes its place in the household of science without any probationary period. The volume before us represents the best thought of teachers trained in one of the strongholds of anatomical science.

G. H.

DISEASES OF INFANCY AND CHILDHOOD. By L. Emmett Holt, A.M., M.D. D. Appleton & Co. 1897. 1117 pages.

In this work Dr. Holt has contributed a voluminous addition to the already extensive collection of books upon this subject. While, on the whole, it is very largely a record of personal experience, frequent reference is made to the recent investigations of other active workers in pediatrics, both in America and Europe.

The book is divided into two parts: Part I. including chapters on the hygiene and general care of infants and young children, growth and development, and peculiarities of disease in children.

Part II. is divided into ten sections, including diseases of the new born, nutrition, diseases of the digestive system, respiratory system, circulatory system, uro-genital system, nervous system, blood, lymphnodes, bones, etc., specific infectious diseases, and other general diseases as rheumatism, diabetes, etc.

These sections include from seven to thirteen chapters apiece, which cover pretty thoroughly the subjects under investigation.

Sections II. and III. have to do with nutrition and diseases of the digestive tract and are quite exhaustive as well as most instructive throughout. Considerable space, about 75 pages, is devoted to infant feeding and infant foods, their preparation and nutritive value. Many dietaries and chemical analyses are appended. Six full chapters discuss the diseases of the stomach and intestines and numerous suggestions as to treatment, hygienic, dietetic, and medicinal are included. The different pathological states of the digestive tract are well illustrated.

In section IX., including chapters on the specific infectious diseases, Dr. Holt primarily divides these into those, the specific poison of which is unknown and those of which it is known, the former being included under the contagious, the latter under the communicable, but not strictly speaking contagious diseases. Syphilis, influenza, and malaria have not been included in either of the above groups.

Although the general characteristics of syphilis ally it with the second group, Dr. Holt does not think the Lustgarten's bacillus has been proved positively to be the cause of this disease, although quite uniformly found in the lesions. In its communicability influenza resembles the first group, although it is admitted there is now little doubt that it is due to the Pfeiffer's bacillus.

Malaria is placed in a class by itself, differing in all its essential features from the other diseases of the general group, as its specific poison is a form of protozoa.

Each disease of this section is reviewed in a scientific manner and complications and sequalæ receive due consideration. The treatments are full and include almost everything that is modern and efficacious. Over 50 pages are allotted to the study of diphtheria and its complications. Details of the chemical and bacteriological diagnoses are discussed and many tables of statistics show the results of the serum treatment, both in hospital and private practice.

Throughout, the book is interesting reading and has two hundred and four illustrations which are fairly good, and seven colored plates which we think poor. It is rather too voluminous both as a text-book for students, and for the desk of the busy practitioner, yet it contains a great deal of general information and, as a book of reference, is well worth a place in the library of the physician.

R. S. J. M.

Autoscopy of the Larynx and Trachea. By Alfred Kirstein, Berlin. Translated by Max Thorner, Cincinnati. Philadelphia: F. A. Davis Co. 1897.

This monograph, which first appeared November 11, 1896, gives a full description of the technic of Kirstein's method of examining the larynx, and sets forth the advantages claimed for this method by its originator. It is natural that the author should have been somewhat enthusiastic as to the possibilities of the method. Nor is it at all singular that those familiar with laryngoscopy should lack the incentive, or, perhaps, the patience, to acquire dexterity in autoscopy

of the air passages. Again, although it appears probable that few laryngologists would have much difficulty in acquiring the necessary tact, still, as a result of various experiments, it seems that there are few patients that can easily tolerate the instrument, and this method has not been found by others as satisfactorily in practice as one would be led to suppose from perusal of this monograph. As the author well states in the monograph, laryngoscopy is the gentler method. He says furthermore, that about one-half of all patients can be so well examined with the autoscope that the posterior region of the larynx is exposed to view, and that, according to his experience, in the case of about one-fourth of all adults the whole larynx and the whole trachea can be conveniently examined. Although this does not appear a very favorable showing, yet the method would appear to present certain advantages, especially for operative procedures in children. In the author's *résumé* of the whole subject, he states that "Individual adaptability to autoscopy varies within wide limits," that "Laryngoscopy . . . will continue to be the standard method," but that "Autoscopy is an important addition to laryngoscopy, especially for examining the posterior wall of the larynx and the trachea." "In the examination of children, autoscopy is indispensible in some cases; especially with the aid of anesthesia, it can be carried out without any great difficulty," and "In endolaryngeal and endotracheal surgery autoscopy will take the front rank as the standard method; of course within anatomical limits." His statement, however, that cocaine would also have to be used in order to make the epiglottis tolerant of the instrument, and that cocaine would be dangerous to persons under an anesthetic detracts somewhat from the apparent value. The author believes that the laryngological examination of children will be immeasurably aided by the autoscopic method, that the larynx and trachea can be examined in anesthetized children with such thoroughness as was never before possible. He says that it is frequently feasible, especially in young children, to dispense altogether with anesthesia and still to get a good view of the laryngo-tracheal tube. In conclusion, he states that it must be repeated that autoscopy is an art that requires study and practice. "The art of pressing into the tongue with the least possible amount of irritation forming a longitudinal groove, reaching downward and backward as far as possible, and approximating in direction the axis of the laryngo-tracheal tract." Although it may readily be questioned whether this method will be of great value to many laryngologists, the book certainly deserves the perusal of all.

E. F. I.

Cutaneous Medicine. A Systematic Treatise on the Diseases of the Skin. By Louis A. Duhring, M.D., Professor of Diseases of the Skin, University of Pennsylvania; etc. Part I. Philadelphia: J. B. Lippincott Company.

For many years the author of the work in review has stood in the foreground for advancement in dermatological education. His text-book, published several years back, held a standard position for its excellent method in the presentation of the subject to the student, so that another work by the same author, evidencing the same careful attention to detail, is bound to be welcome.

Part I. of this system of "Cutaneous Medicine" is really introductory to the subject of dermatology, and its 221 pages discuss the material generally treated in a perfunctory manner by a single chapter in the usual text-book on skin diseases.

Dr. Duhring is keen in his observation of the failure of most students to

appreciate dermatology because they have not learned the "alphabet." The fault lies in the absence of application to the very essentials in the field of study, namely, the anatomy, physiology, pathology, and symptoms common to each and all diseases of the cutaneous tissues. With this premise, we must express strong appreciation of the chapters on anatomy, physiology, and pathology in the work before us.

For the purpose of a more perfect understanding of the anatomical relations of the several layers of the skin these relations are presented in every way conceivable. The illustrations are admirably adapted, and no pains have been spared in making these profuse. In each division of the layers of the skin, the development of the cells is clearly defined, and explicitly described. Due importance is given to the granular, chemical, and the fat elements of the skin, and the keratin combinations in their relations to the consistency of the skin. Special stress, with an excellent plate accompanying, is laid upon the nerve distribution in the skin, and upon the growing relation of the nervous system to the pathology of many of the constitutional diseases.

In the chapter on the physiology of the skin, special attention might be called to the portions on absorption and on the regeneration of the skin.

Excepting that the definitions are clear, no comment is called for in the chapters on the lesions of the skin, and on the general symptoms, both being simply expositions of the terms used, in which nothing new is suggested.

In the chapter on treatment, we understand that only an introductory idea is intended to obtain and with this object, the field is covered by modern and accepted methods. A digression is indulged in on arsenic, which the author continues to praise, while he contends that its indiscriminate use is liable to provoke its abuse. The mineral springs are enumerated in short space; only too short, we think.

Altogether, Dr. Duhring has made us expectant, and we feel satisfied that when subsequent volumes appear, they will not fall short of the standard set in Part I. The publishers have presented a typographic success, and the illustrating is particularly well done.

ISADORE DYER.

THE DIARY OF A RESURRECTIONIST, 1811 TO 1812. To which are added an account of the Resurrection men in London and a short history of the passing of the Anatomy Act. By James Blake Bailey, B.A., Librarian of the Royal College of Surgery, England. London: Swan, Sonnenschein & Co., Lim.

Doctors, in general, have felt of late a glow of satisfaction since the evolvement from the brain of a noted Scotch novelist of a wonderful medical man, Dr. MacLure. Possibly it is their last chance, for that hero was evidently a survival and he died, in the book, some time ago, and we have always felt, what the Scotch call, "wee doots," about him, any way. It is not so difficult as a layman might imagine to draw such an angelic character—but to make him human, now, that's the "deefeculty." The man and his horse had iron constitutions; evidently they thought nothing of working 28 or 30 hours a day—and cold days at that—snow drifts never troubled them; fatigue never affected them. Wherever an average mortal would be bad, the author made them good. *They*, the man and the horse, lived on nothing, they were thankful for smallest favors, they never refused or resented anything. They were too good. But while men may admire such a character, there still exists down deep in the heart of the uncultured, and half way down in the educated, a distrust of the doctor. He may be kind, he may work for nothing, but you feel all the time

that he wants "to dissect you." You can reward him, too, for life long arrears of indebtedness, by bequeathing him your body; *it* is to him the most precious gift imaginable; he will take it, sharpen an immensely long knife, grin with fiendish glee, snap his jaws like a celebrated preacher and proceed to gouge out your eyes, hack up your body and limbs, tear out liver and lights, and dance about with a howl of horrid joy. This is the underlying idea, either purely hereditary, or taught by nurses to little boys and girls with the threat, "The doctor will get you;" it is the doctor's part in folklore, it seems ancient but is not very improving. Possibly some of the intensity of this thing is due to the transmitted horror of the days, early in the century, when England was in a frenzy of fear over the doings of Burke, Hare and their imitators. "The Dairy of a Resurrectionist" gives us a glimpse of that time which is of interest in many ways. The book shows us portraits of two eminent operators in this field, after they had been hung. It shows also some of the efforts made at the time to allay the fear of anxious friends and protect the corpse beyond possibility of outrage.

Even Southey composed "The Surgeon's Warning," from which the editor of the Diary quotes, but he omits the significant lines

"Bury me in a patent coffin"
"That I may rise no more."

Where the underlying thought is not of the early rising that he dreaded, to the anatomical room, but of the difficulties which *it* might throw around that subsequent rising, to which, as a good churchman, he looked forward, for the thought would intrude, and dog his dying hours, of the added difficulties when limbs and organs would, at the last trump, have to come hopping and crawling from the museum shelves; from the wet specimen jar and the dry preparation, when perhaps the newly arisen might even feel the wires of their mounting still sticking through their sensitive spiritual bodies. Wise then was the man who, notwithstanding the line, "Bury me in lead when I am dead" trusted to stronger metal: enclosed his precious dead—or precious self in cage of iron—or built above them massive walls—or more canny still, with the ostentation of terror, buried a "small box enclosing some deathful apparatus" with wires and "a large quantity of gunpowder." Piety and science can hardly go further unless some genius adapts to the tomb a time lock, like the locks in bank safes, set to open only at the last day.

EDWARD WILLARD WATSON.

AN AMERICAN TEXT-BOOK OF PHYSIOLOGY. By Henry P. Bowditch, M.D., John G. Curtis, M.D., Henry H. Donaldson, Ph.D., W. H. Howell, Ph.D., M.D., Frederic S. Lee, Ph.D., Warren P. Lombard, M.D., Graham Lusk, Ph.D., W. T. Porter, M.D., Edward T. Reichert, M.D., and Henry Sewall, Ph.D., M.D. Edited by William H. Howell, Ph.D., M.D., Professor of Physiology in the Johns Hopkins University, Baltimore, Md. Philadelphia: W. B. Saunders, 1896. Cloth, $6.00; sheep, $7.00; half morocco, $7.00.

This text-book of physiology is more elaborate and deals with the subject much more thoroughly than most of our previous works. As stated in the preface, the division of labor in the collaboration method enables the several writers to present their respective subjects upon a more comprehensive knowledge than if one author were to write the entire book, for it is impossible for one teacher to be equally thoroughly informed on all branches of the subject. It is claimed that the student has the advantage of having the views of different teachers. It

is an open question if all of these systems written by so many contributors actually possess all of the advantages claimed for them. Such a book is very apt to be more uneven than if written by one strong author, while very little is gained in having the different views of various teachers since they write on quite different subjects.

The book deals with the subject in a purely scientific manner without pointing out the close relationship existing between physiology and practical medicine. Physiology is studied by most students as a foundation for the study of medicine, and it is a very great advantage to have the bearing of the one upon the other constantly pointed out.

The first section on The General Physiology of Nerve and Muscle is very well presented with sufficient detail of methods to make the statements clearly understood. As this seems to be the only place in the book in which the reaction of degeneration is dealt with, it is to be regretted that more attention is not given to it, because of its practical importance.

The chapter on Secretion includes the internal secretions of the liver, pancreas, thyroids, adrenals, pituitary body, and testes. The difficult subjects of Digestion and Nutrition are dealt with in a very able manner and described very clearly. In treating of the small intestine, the reactions of the contents is not stated until the small intestine empties into the colon. This is a matter of great importance concerning the explanation of the digestion of fats.

The section on Dietectics is very meagre and stands greatly in contrast with the exhaustive way in which other less important topics are treated. The chapter on the circulation is particularly good and deserves great praise.

Respiration and Animal Heat are gone over very thoroughly, the latter in particular receiving much more careful attention than in most text-books of phyisology.

Perhaps the most disappointing part of the book is the section on the Central Nervous System. A very conspicuous feature is the amount of assistance derived from psychology, while pathological conditions, which are of enormous help in the study of the physiology of the nervous system, receive very little consideration. The neuron is described as the outgrowth of the cell-body. The physiology of the nervous system has been so thoroughly revolutionized by the discoveries of recent years that this chapter would naturally be expected to be quite different from those of former text-books. It should always be borne in mind that the student of to-day is the practitioner of to-morrow, and the arrangement of a subject and the presentation of experiments should always be done in such a way that the application to higher forms of life can readily be seen. Particularly should details of subjects of only scientific interest be omitted when more important practical subjects are not dealt with so thoroughly. Thus the effect of fatigue upon nerve cells is quoted in detail, while the sympathetic system is disposed of in less than half the space by discussing the relation between the sympathetic ganglia and the spinal cord. The important subject of reflex action is dealt with in a general way upon lower animals, while the reflexes which are studied clinically are not considered, with the exception of the knee-jerk. Aphasia receives very little attention.

The chapters on the special senses are very good, while the chapter on reproduction is one of the best in the volume.

The book closes with a very carefully prepared chapter on the chemistry of the animal body. Altogether, the book is, perhaps, not so well adapted for the student as for the physician.

W. S. C.

A System of Gynecology by many Writers. Volume II. of a System of Medicine. Edited by Thomas Clifford Allbutt and W. S. Playfair. Octavo, 973 pages. 242 illustrations in the text. New York: The Macmillan Company, 66 Fifth Avenue. 1896. Prices: cloth, $6; Half leather, $7. With Allbutt's System of Medicine the prices are one dollar less.

At no time have the so-called "systems" of medicine been so popular with the profession as at present. There is hardly a specialty of any importance that has not been honored by the production of a huge volume, the combined product of many authers more or less distinguished. Such works have a ready sale and redound to the credit of the publishers, but it is a question whether they are in the best interest of the profession. Instead of buying the works of one or more well-known authorities, the physician is tempted to buy a "System" with the idea that for the cost of one book he is enabled to obtain the combined views of many contributors. In reality he buys a collection of monographs varying greatly in excellence and sometimes differing radically in the general methods of treatment. Inconsistencies, contradictions, and omissions are liable to occur and their number depends upon the care with which the editor has performed his work and the amount of consultation which has taken place between the different contributors.

Judging from the list of distinguished contributors and from the vast amount of reading matter contained between its covers, we should be greatly disappointed if this work were not one of the most valuable that has appeared in the English language. A careful examination shows that it is an improvement upon the other systems of gynecology, many of whose faults and failings have been avoided. The ground is covered more fully by the greater number of subdivisions into which the book is divided, and there is less "padding," allowing the subject matter to be condensed into a volume of quite convenient size. Some of the articles are beyond criticism; many are excellent, others do not shine by comparison but, taken as a whole, the work forms a valuable contribution to medical literature as indicating the present position of gynecology in Great Britain. Its most striking defect is its poverty of illustrations; the illustrations, 242 wood cuts, are deficient in number and quality.

I. The Development of Modern Gynecology, by M. Handfield-Jones, is an interesting and instructive review of the advances that have been made within the past fifty years.

II. The Anatomy of the Female Pelvic Organs, by Berry Hart, allows of no criticism except that too little space is devoted to histology and embryology.

III. Malformations of the Genital Organs in Women, by J. William Ballantyne. This article is an excellent one, enumerating the malformations, defining the various names used in designating them, giving the embryological causes and the clinical features of each one and ending with a section on hermaphrodism and its varieties.

IV. The Etiology of the Diseases of the Female Genital Organs, by W. Balls-Headley is a very good article. Although in parts of it the author allows his imagination too much play in depicting the terrible results of the social evils he would correct. The influences of heredity, training and education, modern social usages, sexual irregularities, infectious diseases, and accidental causes upon the health of the modern woman are discussed in an interesting and dignified manner and many points worthy of careful consideration are brought out.

V. Diagnosis in Gynecology, by Robert Boxall. In the first paragraph the author states that "the object of this article is to collate, with a view to diagnosis, the various symptoms and physical signs met with in the diseases peculiar to women." He divides the subject into two parts, the history of the patient and the physical examination. The importance of the various points to be brought out in the history of the patient is discussed at length—according to the views of some authorities at greater length than it deserves. The description of the methods of physical examination ignors completely the use of the cycloscope and rectal speculum and the use of the microscope in confirming a diagnosis is disposed of in a paragraph of six lines.

VI. Inflammation of the Uterus, by A. H. F. Barbour. This is a thoroughly scientific treatise on chronic cervical catarrh, endometritis, and metritis—their etiology, pathology, physical signs, clinical symptoms, and treatment, according to the most modern views on the subject. The acute stages of these conditions are considered to belong to obstetrics and not to gynecology. He emphasizes the importance of constitutional treatment, believing that too often the local therapy, now so common, is not only useless but even mischievous, directing attention too much to the pelvic organs when the disturbance may be due entirely to a systemic condition. Pathology is regarded as the foundation on which our theories of treatment must rest, so a classification based upon the morbid changes is preferred to one according to the symptomatic manifestation. The most important local agent in cervical catarrh is the vaginal douche, then medicated tampons and, finally, where there is great induration, depletion by scarification is advised. When destruction of the glandular elements of the cervix is necessary the curette or Shröder's operation is preferred. This latter operation is given preference over Emmet's trachelorrhaphy as better adapted to cure the diseased cervical condition.

When local treatment of endometritis is required the applicator armed with medicated cotton is preferred to the injection of fluids into the uterus. The curette is indicated in cases with thickened rough endometrium and in cases of recent abortion followed by menorrhagia not amenable to ergot—"It is not called for in cases of catarrhal endometritis."

VII. The Nervous System in Relation to Gynecology, by W. S. Playfair. In this short essay the author points out the important relation existing between the early education and training of girls and their health in after life. It is upon the more delicate organisms of women that the effects of the increased nervous activity necessary in our modern life are most marked and, in order to get them to withstand the increasing strain, more judicious attention must be paid to the physical health of the young girls.

The functional neuroses are divided into two classes—one in which the origin is in some pelvic lesion, the other in which the local condition is of minor importance secondary to the general neurotic disturbance. In the latter class the value of the rest cure is inestimable and "hundreds of women are now going about well and strong, who but for this would still be the wretched invalids they formerly were."

Insanity rarely depends upon morbid conditions of the reproductive organs. Insane women have various pelvic lesions as do sane ones and they should receive treatment appropriate to such lesions without regard to the mental disease. "No operation of this kind [removal of tubes and ovaries] is permissible in an insane patient unless some structural lesion exist which would call for or justify the operation were the patient sane."

VIII. Sterility, by Henry Gervis. Cases of sterility are divided into abso-

lute and contingent and each of these classes are subdivided into congenital and acquired. The absolute differ from the contingent in that in the latter there is always a possibility of impregnation in spite of pathological conditions. The surgical treatment of the causes is referred to the appropriate sections of the book, the author contenting himself with a discussion of the value of the various therapeutic measures that have been suggested. The various watering places and springs are of value only when their waters tend to cure the pathological condition on which the sterility depends.

IX. Gynecological Therapeutics, by Amand Routh. This article has a broader scope than its title would imply. General hygiene, rest, drugs, balneology, local therapeutic measures, general operative measures, and therapeutical operations are given as careful consideration as is possible in a space of fifty pages. Some of the methods advised differ from those in general use in this country and can hardly be said to be an improvement. For example: too much importance is attached to chemical sterilization of instruments, ligatures, sponges, etc. The permanganate method of cleansing the skin certainly possesses no advantages that ofset its disagreeable and tedious technique. The hot air and steam sterilizers are not mentioned, nor is the use of soda in the water in which instruments are boiled. The view that ether causes greater liability to hemorrhage during the operation than does chloroform can hardly be substantiated. Slow dilitation of the cervix with tents is discarded in favor of the less dangerous and less troublesome rapid method, but Hegar's dilators are preferred to the two or three bladed instruments. The article is well illustrated and, taken altogether, is an excellent one.

X. The Electrical Treatment of Diseases of Women, by R. Milne Murray. A minute description of the instrumental equipment required in gynecological electro-therapeutics with pictures of the important parts is first given, then follow the mode of making the applications, the mode of action of the continuous current, and finally the therapeutic application of electricity.

The author does not believe in any "interpolar" decomposition by the current of tissues lying in the path between the electrodes. Any decrease in size is due to stimulation of the muscular fibres, which by their contraction, diminish the size of the tumor. "Electrical currents in some way induce an improved nutrition and a general exaltation of function in which the nervous system especially participates."

In *Stenosis* congenital or acquired electricity is better than dilatation by other methods—it is painless, does not interfere with the ordinary routine of life and gives more permanent results. A current of 50 to 80 M. A. is used twice a week for eight or ten times for five minutes at each sitting.

In *Endometritis* the author is "convinced that electrical treatment will cure any case curable by curetting and will also cure many cases that curetting can not cure." The length of time (2 to 4 months) often presents a serious disadvantage, so in obstinate chronic cases he advises curettage, and upon signs of recurrence the use of electricity.

Subinvolution. "To nothing does it yield so thoroughly or so expeditiously as, in my experience, it has done to electrical treatment." An interrupted current as strong as it can be borne, is applied 10 or 15 minutes 2 or 3 weeks 3 or 4 times a week to tone up the interior wall; then a continuous current, positive pole in the uterus, is applied as in endometritis.

Fibroid Tumors of the Uterus. "'Apostoli's' method is now generally regarded by those who have given it a fair and intelligent trial as fulfilling a certain well defined but highly important function in gynecological therapeutics;

and those who have not given it such a trial have no right to an opinion one way or the other." If the object of the gynecologist is to remove the pain, hemorrhage or pressure symptoms caused by a fibroid tumor rather than to remove the tumor itself or to diminish its bulk to any great extent, then Apostoli's method is a very valuable one. Sub-serous, fibro-cystic, and edematous fibroids are not benefited, while purulent salpingitis or peritoneal adhesions due to chronic peritonitis are contra-indications. All others that give rise to hemorrhage are suitable for treatment with electricity.

Pelvic Exudations. The author has had no experience with this treatment in acute exudative stages. In the chronic condition electro-puncture with the negative pole for 2 or 3 applications will cause marked diminution in the size of the exudate and then the intra-uterine applications may be begun and continued until the mass has almost entirely disappeared, which will be in a short time.

The article is by far the best exposition of the practical value of electrical treatment in gynecology that has been published in English.

XI. Disorders of menstruation, by J. Halliday Croom. This article forms a comprehensive and masterly treatise. The various forms of amenorrhea, menorrhagia, metrorrhagia, and dysmenorrhea are classified according to their causes, the symptoms of each and the appropriate treatment are given with most satisfactory minuteness of detail.

XII. Diseases of the External Genital Organs, by W. Smyly. This article is a condensed enumeration of the diseases of the vulva and vagina, their symptoms, diagnosis, prognosis, and treatment.

XIII. Displacements of the Uterus, by A. R. Simpson. The normal position of the uterus is attributed to the support the cervix receives from the tip of the sacrum and coccyx in the pelvic floor and to the combined action of the various ligaments. The various displacements are treated in succession, especial attention being given to the pathologial anatomy, the causes, passive and active, the complications, symptoms, diagnosis, and treatment, palliative and operative, of procedentia uteri and of the retro-displacements.

XIV. Injuries in Parturition, by G. Ernest Herman. Lacerations, fistulas, and morbid involution receive careful consideration both from an obstetrical and from a gynecological standpoint, the description of the various forms of fistulas and their causes being especially worthy of note. The author advocates the use of the adjective cervical in place of utero, as designating more accurately the forms of fistula involving the lower portion of the uterus. The discussion as to the method by which physiological involution takes place and that in regard to the morbid anatomy and causes of subinvolution and superinvolution is especially interesting.

XV. Extra-Uterine Gestation, by J. Bland Sutton. Coming as it does from the pen of such an authority this article could not fail to be an elaborate and thoroughly scientific treatise on a subject upon which so much work has been done. After reviewing the many theories concerning the unknown causes of tubal pregnancy the author says "the evidence now indicates that a healthy Fallopian tube is more liable to become gravid than one that has been inflamed." Tubal pregnancy is discussed under its various stages, tubo-uterine gestation is next taken up and then the fallacy of belief in the possibility of ovarian pregnancy is shown by the entire lack of proof that such a condition has ever been found.

XVI. Pelvic Inflammation, by Charles J. Cullingworth. The terms pelvic cellulitis and pelvic peritonitis are preferred to the older words parametritis and perimetritis as defining more exactly the conditions meant, and septic infection is considered the sole cause of primary inflammation of these tissues. The

etiology, pathological anatomy, symptoms, physical signs, and treatment of both conditions are carefully discussed. The author rather inclines to the abdominal method of removing uterus and appendages when necessitated by the pelvic peritonitis but acknowledges the advantages of the vaginal operations that are gaining advocates so rapidly.

XVII. Pelvic Hematocele, by W. O. Priestley. The term hematocele is used in this article to designate an encysted extravasation of blood from any part of the generative organs, into the peritoneal cavity or the cellular tissue of the pelvis. The author does not agree with latest views that hematocele is caused always by the rupture of an extra-uterine gestation, but believes that it may be produced by a rupture of a vessel in the ovary, by menstrual flux from the tubes, by rupture of a vessel in the broad ligament, and by bleeding from the altered surface of the peritoneum itself. The palliative treatment of the symptoms is recommended as the best, and operative interfence is advised only when the symptoms are very severe and the tumor shows a continual tendency to increase. Considering the fact that the vast majority of hematoceles are the result of ectopic gestation this palliative treatment is in marked contrast with that advised by Sutton in the article on extra-uterine gestation.

XVIII. Benign Growths of the Uterus, by F. W. N. Haultain. This article treats of the non-malignant tumors of the muscular wall and those of the endometrium, giving a careful description of the various forms of tumors with their pathology, symptoms, and appropriate treatment. Not every fibroma requires removal. Operation is justifiable only when the symptoms demand it, electrical and medical treatment are to be tried and in case of failure removal of the appendages is to be resorted to in favorable cases. When castration is impossible and the tumor already as large as 6 months pregnant uterus is growing rapidly, total removal is advised. Total removal is advised in tumors of the cystic edematous variety. The author loses no chance to rave against those "smitten with the hysterectomy furor" and certainly his advice shows that the "furor" has not seized him.

XIX. Hysterectomy, by J. Knowsley Thornton. In this excellent article Thornton takes a more advanced position than the author of the preceding one. In regard to fibroid tumors he believes that the increased success of the operation in competent hands justifies the operator in advising "operations of expediency when necessity can hardly be urged" on account of rapid growth, hemorrhage, or pain. He prefers the supra-vaginal operation with the Koeberlé's serre-nœud, though the intra-peritoneal method devised by Baer, of Philadelphia, has given him excellent results. The complete abdominal method "would (he thinks) soon hold the field alone if the difficulties with regard to the roof of the pelvis, and the damage done to the vagina could be satisfactorily overcome."

Vaginal hysterectomy is applicable only to small tumors, which in England are not thought to require removal. If such small tumors produce severe hemorrhage, castration should be tried if the complete removal of both ovaries is possible. If this is not possible hysterectomy must be performed. Hysterectomy for procidentia should be done through the vagina.

The descriptions of the various methods of hysterectomy are very complete and the good and bad points of each are discussed in a manner that shows a thorough familiarity with the subject.

The improved method of Cesarian section as suggested by Sänger and perfected by Leopold is preferred to either the Porro operation or the complete removal of the uterus. Sänger's and Porro's operations are described at length. Altogether the article is an excellent one.

XX. Malignant Diseases of the Uterus, by W. J. Sinclair. Cancer of the cervix and the body of the uterus and sarcoma are discussed most thoroughly. The many theories and clinical observations as to the causes of cancer of the cervix are reviewed and its symptoms and clinical course are described minutely. The point is made that as its early diagnosis rests with the general practitioners, rather than with the microscopical expert, physicians should be trained to recognize the condition by its clinical symptoms and its macroscopical appearance. Vaginal hysterectomy is the only operation to be thought of in all cases of malignant disease of the uterus seen before the pelvic connective tissue has been invaded. The sacral method, Freund's combined vaginal and abdominal method, and high amputation of the cervix are described and condemned.

After reviewing the many theories and arguments in regard to malignant adenoma he concludes that "all activity of the endometrium which is not completely accounted for by other ascertainable causes should be looked upon as malignant. The article concludes with a description of deciduoma malignum and, altogether, it is one of the best in the book.

XXI. Plastic Gynecological Operations, by John Phillips. This is a fairly good article, although enough care has not been devoted to the details of the operations described and the diagrams explaining them are, in some cases, very inaccurate.

XXII. Diseases of the Fallopian Tubes, by Alban Doran. This is a highly satisfactory article. All the diseases of the tubes are described and especial attention is given to tuberculosis, papilloma, and cancer: Many of the views expressed are the result of the author's personal investigation and form a valuable contribution to our literature. The discussion of the relation existing between papilloma, cancer, and chronic inflammatory conditions is especially interesting. The article, covering 54 pages, is the best illustrated in the books and contains a table of the cases of papilloma, primary carcinoma, and sarcoma that have been accurately reported.

XXIII. Diseases of the Ovary, by W. S. A. Griffith. In the 36 pages devoted to this subject, tumors, both solid and cystic, inflammation, perioöphoritis and oöphoritis, hematoma, prolapse, and hernia are described. Many valuable points are developed in regard to the origin of cystic tumors of different kinds, their tendency to malignant degeneration and metastasis.

XXIV. Ovariotomy, by J. Greig Smith. The mortality of all operations for the removal of tumors of the ovary is placed between 4 and 5 per cent. This article includes the preparatory arrangements of the patient, operating room, table, instruments, sponges, ligatures, and the steps of oöphorectomy and salpingo-oöphorectomy. The author taps the cysts with a trochar before delivering them, uses sponges, irrigates whenever there has been escape of blood or other fluids into the peritoneal cavity. As for drainage, he says: "It is certainly true that drainage has done more good than harm; with moderate care it can scarcely do harm: therefore, it is a good rule to drain when in doubt." Also: "The gauze drain is very rarely employed after ovariotomy."

Under After-treatment we find the following: "To keep the patient in the supine posture, to draw the water at stated intervals, and to starve the patient of all liquids are quite unnecessary in the majority of cases and cause suffering in not a few." Again, in regard to relieving the thirst, he says: "But in ordinary cases liquids may be given by the mouth almost from the beginning." He prefers any other kind of liquid food to milk on account of the latter's tendency to cause flatulence and constipation.

XXV. Chronic Inversion of the Uterus, by Edward Malins. In this article

the anatomy and pathology, the mechanism of production, the etiology, symptoms, diagnosis, prognosis, and treatment of this rare condition are discussed at length.

XXVI. Diseases of the Female Bladder and Urethra, by Henry Morris. This article is far behind the times as regards methods of diagnosis and treatment. Considering the great advances that have been made on these lines within the past few years it is surprising to find that the author has ignored all the modern methods. For example, no mention is made of either the urethrascope or cystoscope, nor of the direct method of examining the bladder, nor of the catheterization of the ureters for diagnostic purposes. On page 940, after advising the introduction of the finger into the dilated urethra he says: "This is undoubtedly the best means of discovering any foreign body, new growth, or morbid condition of the bladder wall." It might have been the "best means" 10 years ago but now it is decidedly antiquated.

L. S. SMITH.

NOTES AND NOTIONS.

The Semi-centennial Meeting of the American Medical Association.

THE semi-centennial meeting of the American Medical Association, which will be held in Philadelphia on the 1st, 2d, 3d, and 4th of June, 1897, bids fair to surpass in the character of the entertainment, the scientific papers, and the number in attendance any meeting which has heretofore been held. The Committee in charge have been able to obtain large and roomy places of meeting for the general meetings and the section meetings, all within a single block and within very short walking distance, or immediately adjacent to the largest and most comfortable of the Philadelphia hotels. For the week preceding and following the meeting, the Committee of Arrangements have also arranged clinical courses, which will be open without charge to all physicians who may visit the city at that time. These courses cover every branch in medicine and its specialties, and will afford visitors the opportunity of seeing the active clinical work of all the great teachers of Philadelphia, which is now, as it has been for so many years in the past in every respect, the medical centre of the United States. The social features of the meeting are especially attractive and include the following functions:

On Tuesday, June 1st, luncheon will be served at the Polyclinic Hospital, on Lombard street; by the Philadelphia County Medical Society, at the Hotel Walton; by the Laryngological, Rhinological and Otological Section, at the Howard Hospital. In the evening, the dinner of the Section on the Practice of Medicine, the Section on Surgery and Anatomy, the Section on Obstetrics and Diseases of Women, the Section on Ophthalmology, the Section of Laryngology and Otology, the Section on Materia Medica and Pharmacy, the Section on Diseases of Children, the Section on

Neurology and Medical Jurisprudence, and the Section on Dermatology and Syphilography, at the Hotel Walton at 7 P. M.

On Wednesday, June 2d, luncheon will be tendered to the Association by the J. B. Lippincott Co., at the Union League Club, and by University of Pennsylvania at Houston Hall, 34th and Spruce streets. Receptions will be given in the evening by the University of Pennsylvania, at the Union League Club; by the Jefferson Medical College, at the Academy of Fine Arts; by the Medico-Chirurgical Medical College, and the Woman's Medical College at their college buildings; and by Prof. J. V. Shoemaker, at 1519 Walnut street.

On Thursday, June 3d, Dr. W. W. Keen will entertain the Surgical Section at luncheon at the Hotel Walton; the Obstetrical Section will be entertained at the Walton; the Neurological Section at the University Club; the Medical Section by Dr. J. H. Musser, at Houston Hall, 34th and Spruce; and Dr. L. Webster Fox will entertain the Ophthalmological Section at the Hotel Bellevue. In the evening the Association will be entertained by Lea Brothers and Company at the Broad Street Opera House.

On Friday, June 4th, the Philadelphia Medical Club will entertain the Association at luncheon at the Hotel Aldine.

Arrangements for a trip to Atlantic City have been made, and will be one of the most attractive features. A very pleasant programme is being arranged by the different Ladies' Aid Societies for the entertainment of the ladies accompanying members. On Saturday, June 5th, the College of Physicians has arranged for the reception of visitors from 9 A. M. until 2 P. M., and Dr. O. H. Allis, Dr. John B. Roberts, Dr. F. P. Henry, and Dr. Guy Hinsdale will lecture on the treasures of the museum and library. Dr. Allis will produce dislocations and reduce them before the audience.

On Monday, June 7th, Dr. Barton C. Hirst expects to perform a Cesarian section at the Hospital of the University of Pennsylvania at 12 o'clock, and on May 27th, will demonstrate deformed pelves in the living subject. During the second week in June interesting Clinics will be held at all the hospitals and the medical profession of Philadelphia will unite in making the clinical attractions a noteworthy feature of the Jubilee of the Association.

HINSDALE.

Let the Teaching in Our Medical Schools be More Practical.

IN a recent competitive examination for resident physicians at the B—— Hospital, 39 students, representing some of the best men of the graduating classes in at least three different medical colleges, appeared. The microscopical examination consisted in a well stained slide of leukemic blood, and a sample of urine containing two large air bubbles, a pus-cell, and several cotton fibres. The leukemic blood was correctly diagnosed and described by but three, thirteen others diagnosing it as blood, and describing it in various ways, such as pernicious anemia, *Plasmodium malariæ*

Diplococci, etc. The following diagnoses were also made: Anthracotic lung, round-celled sarcoma, epithelial cells, hyaline casts, croupous pneumonia, and section of kidney. Of the 39, only six diagnosed the cotton fibre correctly, it being called linen thread (1), wool fibre (1), some foreign particle (3), unknown (3), muscle fibre (3), fibrin (1), mucin (2), nerve (2), elastic fibres and hair (1), elastic fibres (2), spirals from sputum of asthmatic (1), fibrous tissue (4), epithelial, granular, or hyaline casts (5), and cylindroids (6). CATTELL.

American Product Company.

THE intelligent foreigner, or still more the intelligent citizen, may perhaps be somewhat puzzled of late by seeing on our streets large iron tank-carts of peculiar shape, labeled in large letters, "American Product Company," and his curiosity becomes even greater when he finds that these casts collect our garbage. Has it come to this at last? Is garbage our great product? Not corn, nor cotton, nor wheat, nor even multitudinous hogs, but *garbage*. Still the more one reflects the more the irony of the iron cart and its legend is seen to be deadly, for our production of garbage is greater than that of any other country; in it we yield to none. Monopoly cannot kill it; taxation fails to strangle its virile growth. We eat more and waste more than any other nation. We are being ruined by our waste. We seem indeed to have food "to burn," and hence the incinerators. We are a garbage creating nation, and we do not stop with food. We flood ourselves with the garbage of our half consumed thought, and wallow in the rinds and husks, the parings and cores of decayed and antiquated theories on which we try to live and grow. All hail the American Product Company, that gathers and burns to ashes the real garbage! And oh, for a Product Company that could consume with blazing fire and incandescent flame the waste and garbage of our swill pails of finance, in which the collector could find fifty-cent dollars, and single tax, and boss rule, as the real slopman finds the family spoons where the buxom cook is his bosom friend.

We scatter the waste to our charities; we throw it away in bribes to legislators—state, city, and national—and we raise a generation of hogs who squeal over our financial slop. We waste our substance in quackery, living riotously on patent medicine, or we repent and come to ourselves, reaching out for the illusive husks of pathics and cures.

The world—our world is a swill barrel, and the men in it seem but to be those noble creatures—worshipped in old times by the devotees of Tammuz and despised by the ancient Hebrew world as forever unclean. Life is but a struggle and the scramble of a squealing mob around the barrel, leaping against its shiny sides, hoping against hope for its overturn and the outrush to them of the generous American product.

EDWARD WILLARD WATSON.

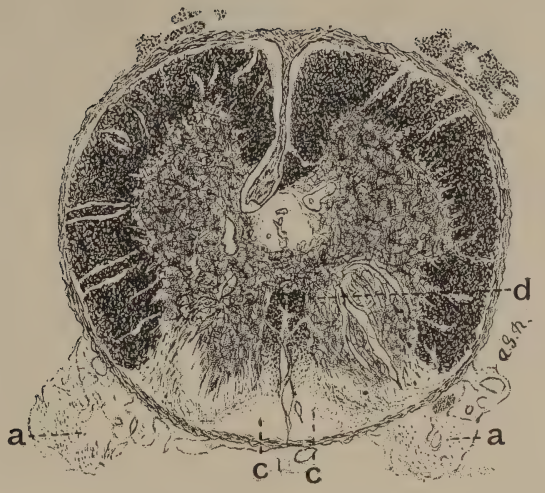


FIG. 1.—Sacral region. *a a* degenerated posterior roots. *c c* degenerated posterior columns *d* ventral fields of the posterior columns intact, although all other parts of the posterior columns are degenerated.

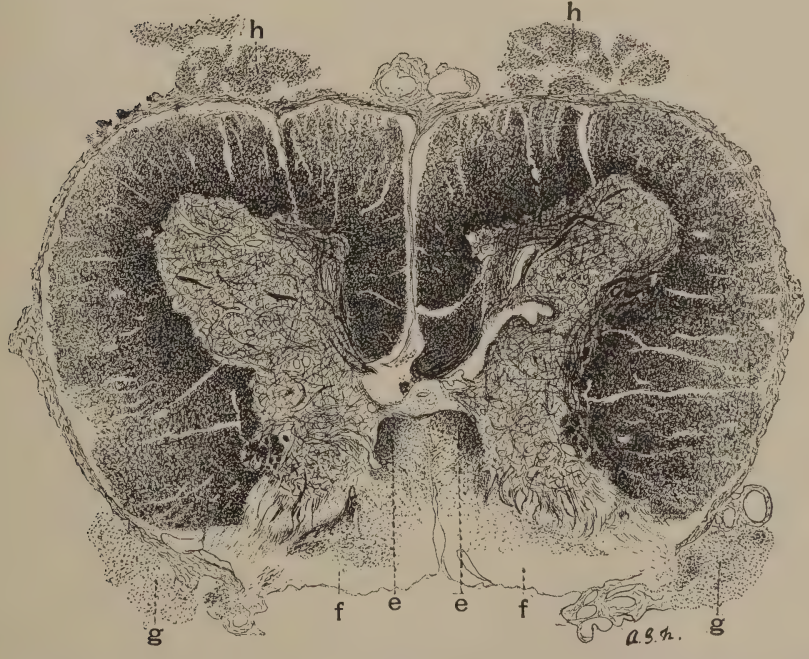


FIG. 2.—Lumbar region. *g g* degenerated posterior roots. *h h* normal anterior roots. *f f* degenerated posterior columns. *e e* ventral fields of the posterior columns intact.

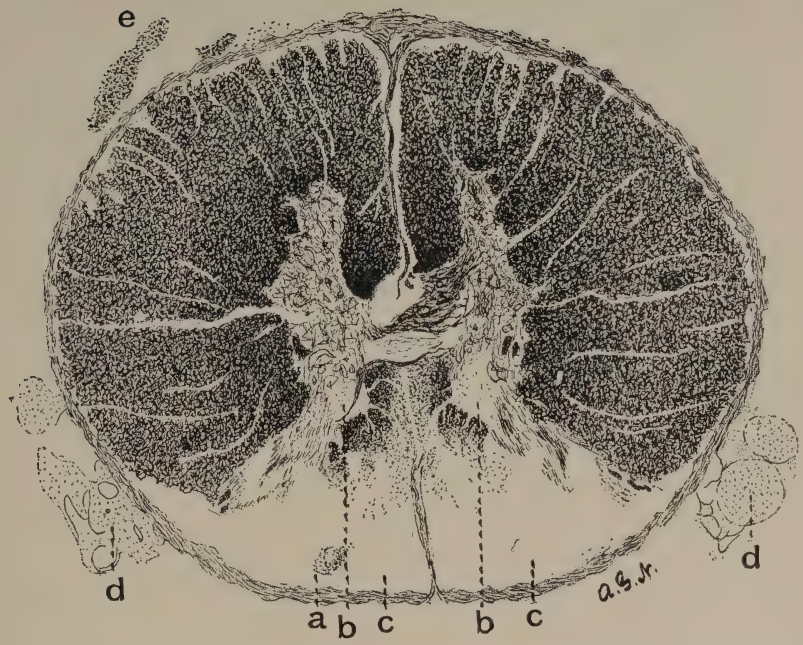


FIG. 3.—Thoracic region. *d d* degenerated posterior roots. *c c* degenerated posterior columns. *b b* degenerated columns of Clarke. *a* small group of normal fibres from one or more posterior roots lower in the cord which were not entirely degenerated. *e* normal anterior root.

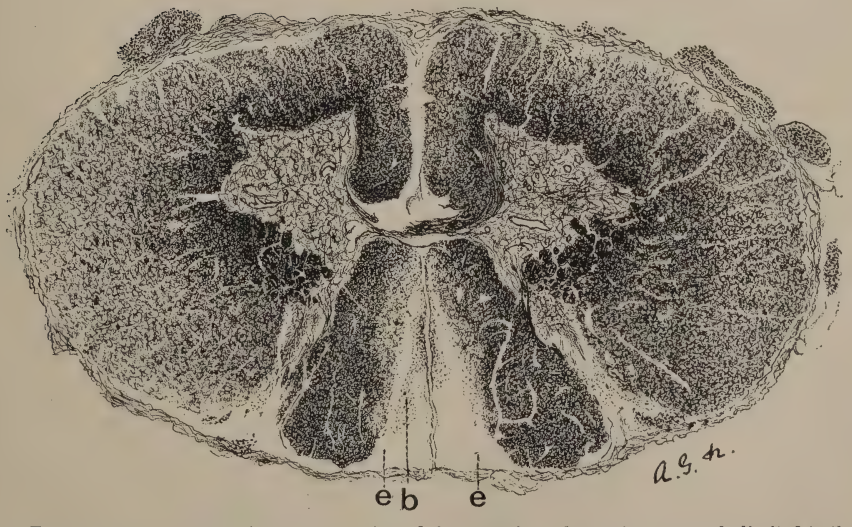


FIG. 4.—Cervical region. The degeneration of the posterior columns is now nearly limited to the columns of Goll *e e*. *b* normal fibres from roots lower in the cord which were not entirely degenerated.

Figures 1, 2, 3, and 4 are from an advanced case of tabes.

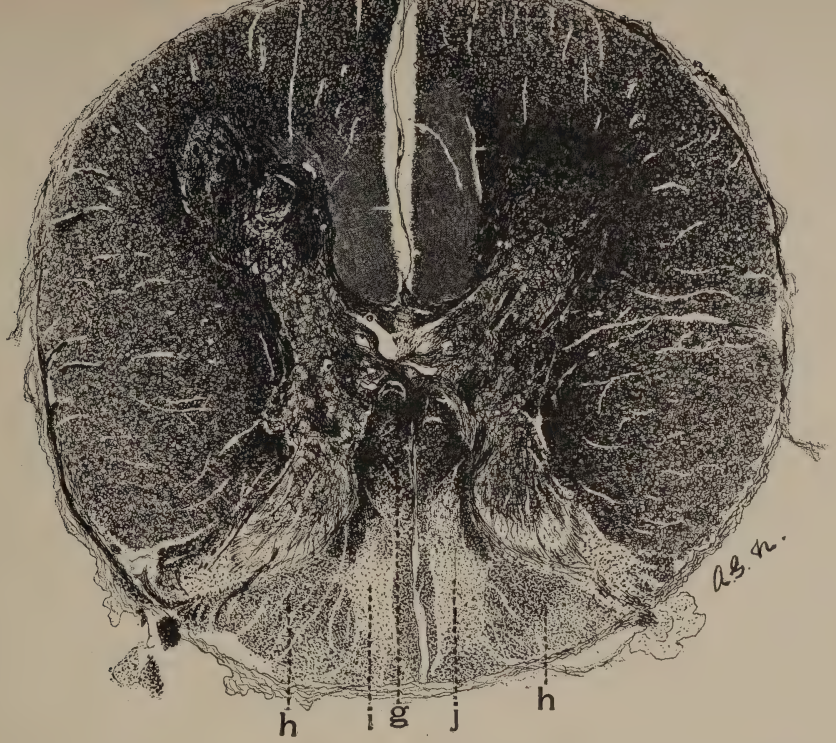


FIG. 5.—Lumbar region. *h h* posteromedian root zones (Flechsig) only slightly degenerated. *i j* middle root zones (Flechsig) degenerated. *g* normal ventral fields. This section represents the earlier lesions of tabes.

Figure 5 may be compared with Figure 2.

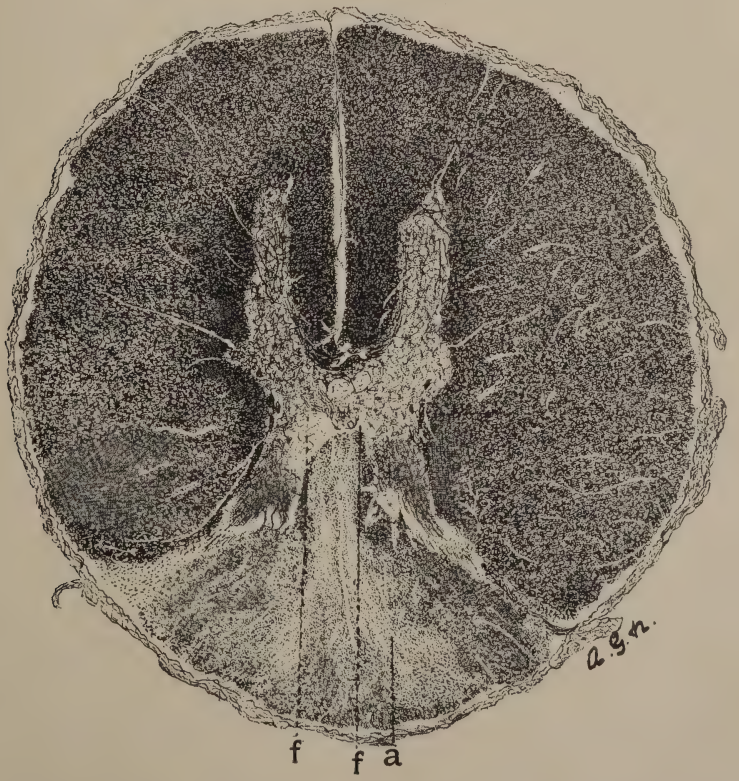


FIG. 6.—Thoracic region. *f f* degenerated columns of Clarke. *a* moderately degenerated posterior columns.

Figure 6 may be compared with Figure 3.

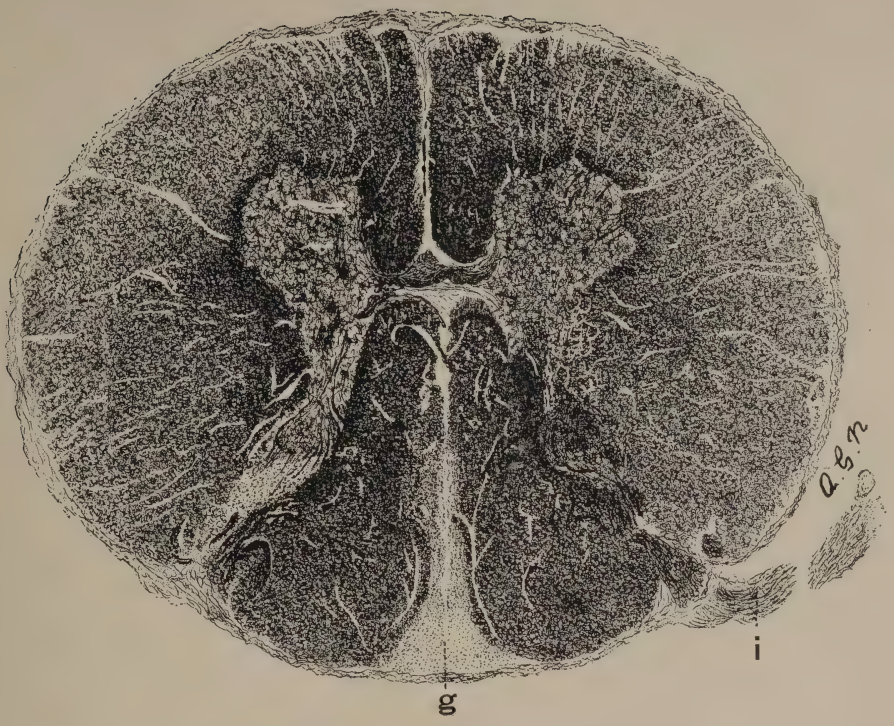


FIG. 7.—Cervical region. *g* columns of Goll only moderately degenerated. *i* normal posterior root. Figure 7 may be compared with Figure 4.

Figures 5, 6, and 7 represent sections from the same spinal cord and present an earlier stage of the disease than do Figures 1, 2, 3, and 4.

FIG. 8.—Normal, posterior, cervical root showing the contraction of the root and the absence of the myelin sheaths at the point of entrance (*c*) of the root into the cord. *e* part of posterior root.

INTERNATIONAL
MEDICAL MAGAZINE.

Vol. VI.] JUNE, 1897. [No. 5.

ORIGINAL COMMUNICATIONS.

THE PATHOLOGY OF TABES DORSALIS;[1]

A Critical Digest.

BY WILLIAM G. SPILLER, M.D.,

Neurologist to the New Jersey Training School for Feeble-Minded Children; Pathologist to the Pennsylvania Training School for Feeble-Minded Children; Associate in Clinical Medicine in the William Pepper Clinical Laboratory.

It is not the intention of the author to quote all the papers which have ever been written on tabes dorsalis. It will be sufficient to bring forward a few of the important points which have formed the subjects of active debate in recent years in neurological circles.

It is necessary, in beginning the study of the pathological process which gives rise to the symptom-complex known as tabes, to describe certain changes which occur in every case of degeneration of the posterior spinal roots, for it seems well demonstrated, to most neuropathologists at least, that tabes is a disease of the posterior roots, whatever they may believe concerning the exact point of origin of the process. These roots are very different from the anterior in their development. They grow from the spinal ganglia into the cord, and in this way form the posterior columns. The anterior roots are formed by the union of the axis cylinders which grow from the motor cells within the anterior horns. The posterior roots in entering the posterior columns do not at once penetrate the apices of the posterior horns, but enter a little to the median side of these, and break at once into many collaterals, or branches. Some of these enter the apices of the posterior horns through the zones of Lissauer; some follow an arched course, and enter the gray substance a little external to the columns of Clarke, in those portions of the cord in

[1] The sections represented in this paper have been prepared by the author from material furnished by Professor Obersteiner in his laboratory at Vienna. The writer takes pleasure in thanking his esteemed teacher for the many acts of kindness shown him on more than one occasion.

which these columns are present; some of these fibres terminate within the columns of Clarke; others push forward into the anterior horns, and terminate in ramifications about the motor cells of these parts. These collaterals to the anterior horns are important, and Koelliker has given to them the name of reflex collaterals, because by means of these the sensory impulses are conveyed to the motor cells, and the reflexes are rendered possible. When these are degenerated in the lumbar region the knee-jerk is lost. This is the condition usually found in tabes. Other collaterals of the posterior spinal roots ascend in the columns of Burdach, or the postero-external columns, for a certain distance, and then bend forward into the central gray matter of the cord. Collaterals also descend in these columns. The long nerve fibres from the lowest part of the cord make their way into the columns of Goll, or postero-median columns, and pass upward to the nuclei of these columns, situated in the oblongata. It is probable that the columns of Burdach in the cervical region are composed almost entirely of fibres from the posterior cervical, and possibly upper thoracic, roots. By means of successive branchings and terminal ramifications these long fibres from the sacral and lumbar regions become less and less numerous in the upper part of the cord, and only a small portion of any given root reaches the nuclei of the posterior columns in the oblongata. Probably no posterior root fibres ascend beyond these nuclei, for in secondary degeneration of the posterior columns the degeneration, except in a few rare cases, cannot be traced above this level. It is true, however, that Schaffer[1] has traced ascending degeneration of the posterior columns into the lemniscus, but Dejerine and Spiller[2] were unable to follow the degenerated fibres beyond the nuclei of the posterior columns in a case of intense and recent ascending degeneration, studied by the method of Marchi.

The fibres which ascend in the posterior columns do not occupy the same portions of these columns at all levels. The fibres of the posterior roots at their point of entrance into the cord are situated close to the median side of the posterior horns, and are gradually pushed inward toward the postero-median septum by successive additions of root fibres. In this way the fibres which enter the lowest part of the cord come in contact with this septum. A degeneration, therefore, which, in the lumbar region, occupies the whole transverse area of the posterior columns, becomes a triangular zone limited to the columns of Goll in the cervical region.

The fibres of any given root which enter a posterior horn do not all do so in the same plane. Some push into the gray matter at the level of the entrance of the root into the cord, but many ascend a certain distance within the posterior columns, and then bend anteriorly into the cinerea (gray matter). We commonly divide the posterior portion of the cord

[1] Karl Schaffer: Archiv für mikroskop. Anatomie, XLIII.

[2] Dejerine and Spiller: Comptes Rendus des Séances de la Société de Biologie, 1895.

into the columns of Goll and Burdach, but Flechsig,[1] from a study of the development of the myelin sheaths, makes very different divisions.

The statement is frequently made that the columns of Goll and Burdach extend into the lumbar region. Strictly speaking, this is not correct. There is no distinct separation of these columns in the lumbar, such as is seen in the cervical region, and ascending are intimately mingled with transverse fibres on their way to the central gray matter. It is only in the thoracic cord, and more especially in the cervical, that we can truly speak of two distinct columns. The columns of Goll contain the fibres from the lower extremities, while those of Burdach the fibres from the upper. It is very doubtful if the latter columns contain any fibres which come from the lower extremities, or even from the middle and lower thoracic regions, though Schaffer (l. c.) thinks otherwise. In a case of syringomyelia, published by Dercum and Spiller[2], the posterior cord was destroyed high up in the thoracic region, and yet degeneration of the columns of Burdach in the cervical region was not visible.

Certain earlier writers have attributed tabes to disease of the posterior roots, but the sytemic idea had taken such a strong hold on neurologists, owing to the influence of Strümpell[3] and Flechsig (l. c.), that there was need of Dejerine,[4] Marie,[5] and Redlich[6] to bring forward again the similarity of the tabetic process with the ordinary degeneration from disease of the posterior spinal roots. The last mentioned author, especially, has devoted a long and excellent paper to this subject.

The degeneration of tabes follows the laws of degeneration of the posterior roots. If the lumbar portion of the cord, in a case of incipient tabes, be examined, a degenerated area will be found close to the median side of each posterior horn, which does not extend very far interiorly. These areas have been known as Pierret's *bandelettes externes* (small external bundles), or as Westphal's root entrance zones. They contain the degenerated fibres, which enter the posterior horns in their passage forward to the motor cells of the anterior horns. Later in the disease, the process extends and occupies a larger portion of the posterior columns. It is doubtful if any fibres cross the postero-median septum, although a few writers, Barbacci, Oddi and Rossi, Berdez (quoted by Redlich), have described such fibres, and Cajal[7] has stated that each nucleus gracilis receives fibres from the column of Goll on each side of the septum. The attempt has been made to explain the symmetry of the tabetic degeneration by the theory of decussation.

---

[1] Flechsig : Neurologisches Centralblatt, 1890.

[2] Dercum and Spiller : The American Journal of the Medical Sciences. December, 1896.

[3] Strümpell: Archiv für Psychiatrie, xii.

[4] Dejerine : Semaine Médicale, 1892.

[5] Marie: Leçons sur les Maladies de la moelle.

[6] Redlich : Arbeiten aus dem Institut für Anatomie und Physiologie, etc., 1.

[7] Cajal: Beitrag zum Studium der Medulla Oblongata, etc.

It is a peculiar fact that the lumbar roots are much more likely to degenerate in tabes than the thoracic and cervical. We do not know the reason for this, we simply are able to make the statement. Cases in which the cervical roots are alone affected are very rare, but they do occur. Raymond[1] and Dejerine[2] have reported such cases, and two others of superior tabes (*tabès supérieur*), as this form is called, are pictured in the beautiful atlas recently published by Marinesco.[3] The last mentioned author well represents the asymmetry seen in some cases of tabes, for, as a rule, the process is symmetrical, or nearly so. When the cervical portion of the cord is alone affected in tabes, the columns of Goll are not degenerated, because the cervical fibres do not enter these columns.

All parts of the posterior columns do not degenerate in an ascending direction. The ventral fields of the posterior columns in the lumbar and lower thoracic regions lie against the posterior gray commissure, and in the upper thoracic and cervical cord, where the columns of Goll spread out like the neck of a flask against the posterior commissure, these areas are pushed more outwardly on both sides. They are known also as the cornu-commissural zones of Marie. It has been supposed that they contain only fibres which arise and terminate in the cinerea of the cord, but Dejerine and Spiller (l. c.) showed, by the method of Marchi, in a case of compression of the cauda equina, that in the thoracic cord there are many exogenic fibres within these areas, *i. e.*, fibres which come from the posterior roots; and their findings have been confirmed by Pineles.[4] These zones in the lumbar cord are preserved for a long time in tabes. Another portion, which also remains intact for some time, is an oval area in the lumbar cord, described by Flechsig (l. c.), one-half of which lies on each side of the posterior septum. Redlich showed that this zone degenerates downward, and is probably not connected with the posterior roots. We do not know its origin and functions, although various theories have been advanced regarding the tract.

Westphal[5] has spoken of the degeneration against the median side of each posterior horn in incipient tabes, and has shown that the patellar reflex is lost when his root entrance zones are affected, *i. e.*, when the degeneration is in the lumbo-thoracic region, in the portion of the posterior columns on each side external to an imaginary line drawn from the angle of the posterior horn to the periphery of the cord. Some cases, however, have shown that the rule is not invariable. Pineles (l. c.) reports the only case of sacral tabes to be found in the literature, according to his statement. The sacral and lower lumbar roots were degenerated; the upper lumbar and lower thoracic were not affected, and the possibility of

[1] Raymond: Revue de Médecine, 1891.
[2] Dejerine: Semaine Médicale, 1892.
[3] Marinesco: Atlas der path. Histologie des Nervensystems, V.
[4] Pineles: Arbeiten aus dem Institut für Anatomie u. Physiologie, etc., IV.
[5] Westphal: Archiv für Psychiatrie, XV., XVI., XVII., XVIII.

peripheral lesions could be excluded. The patellar reflex had been absent during life. He refers to a case of cervical tabes recorded by Raymond, in which there was no degeneration of the lower thoracic and lumbar regions, and the crural nerves were not diseased, and yet the patellar reflex had been absent.

The columns of Clarke begin about the second lumbar segment and extend well up into the thoracic region. Scattered cells are found in the cervical portion of the cord which probably represent the continuation of these columns in this portion. The fibres within the columns of Clarke, which come from the posterior roots, are usually much degenerated in tabes, but the cells, as a rule, are not destroyed, and, consequently, the direct cerebellar tracts, which have their origin in these columns, are not degenerated. Oppenheim and Siemerling[1] have reported two cases in which these columns were degenerated after destruction of the cells of Clarke's columns. It is stated by reliable writers that degeneration of the pyramidal tracts, direct cerebellar tracts, and Gowers' tracts may occur in the later stages of tabes. Redlich (l. c.), in his important paper based on the examination of a number of cases of tabes, stated that he possessed no specimens of such a case, and the writer is forced to the same confession, although tabes is quite well represented in his collection. A case of this kind to be of value must be free from every suspicion of combined systemic disease, as the term is usually understood, for we do not usually include in the latter class those cases in which systemic degeneration of the lateral columns has been added to a tabetic process long existing.

Sometimes in tabes a number of posterior roots may escape degeneration, and others, higher and lower in the cord, may be affected. A sound area is in this way produced in the posterior columns between two degenerated ones, for the sound fibres are, of course, pushed toward the posterior median septum in the same way as the degenerated.

It is necessary to devote a little time to the study of Lissauer's zones, for degeneration of these parts is usually an early lesion of tabes. As the name indicates, it was Lissauer[2] who first fully described these areas. They lie between the gelatinous substance of Rolando, on the apices of the posterior horns, and the periphery of the cord, and between the lateral and posterior columns. They stain differently from the rest of the cord, and contain many very fine fibres and some coarser ones. They vary greatly in size in different parts of the spinal cord; *i. e.*, they are large in the lumbar region and small in the thoracic. The fibres in these zones apparently do not ascend very high, but after a short course bend and enter the posterior horns. This we know, partly from the fact that these zones actually are smaller in the thoracic than in the lumbar portion of the cord. It is not improbable that the fibres which pass through these zones, being

[1] Oppenheim and Siemerling: Archiv für Psychiatrie, XVIII.

[2] Lissauer: Archiv für Psychiatrie, XVII.

much finer than most of the others from the posterior roots, have some special function.

We come now to a consideration of the various theories which have been advanced regarding the primary lesion of tabes, for while the connection of the disease with syphilis seems well established, the portion of the nervous system in which the primary lesions are manifested has escaped detection. Among recent writers Marie[1] has been prominent in the expression of the theory of the location of the primary lesion in the spinal ganglia, though he confesses that his examination of these ganglia in most cases of tabes has been very unsatisfactory. He ascribes the peripheral neuritis of tabes to this primary change of the cells of the spinal ganglia, for he believes that in ordinary neuritis the cells from which the fibres arise are affected, and doubts the possibility of primary degeneration of nerve fibres without involvement of their cells. Babinski (quoted by Marie), is also an exponent of the view concerning the origin of tabes in the spinal ganglia. Oppenheim[2] and Siemerling found great degeneration of the fibres in the posterior ganglia in cases of tabes, but the fibres passing from the distal ends of the ganglia were well stained, as may be seen in a picture given by these authors, and later by Oppenheim[3] alone. The changes in the cells of the ganglia were very insignificant. Oppenheim has found the spinal root of the fifth nerve, and the fibres and cells of the Gasserian ganglion diseased in tabes. These cells, as is well known, give origin to the spinal, or descending (formerly called ascending), root of the fifth nerve and correspond to those of the spinal ganglia. In the opinion of the writer, the theory that the cells of the spinal ganglia may be so altered functionally as to produce the intense degeneration of tabes, and yet this alteration be invisible with the use of the microscope and improved methods, is not satisfactory. Minor lesions might be explained in this way, but not the extensive destruction seen in tabes. Wollenberg[4] was probably the first investigator who found any notable alteration of the cells of the spinal ganglia, and Stroebe[5] has also found lesions of three cells. They have spoken of such changes as fatty degeneration, pigmentation, cloudiness and atrophy of the cells, etc. Wollenberg regarded these changes as slight in comparison with the intense alteration of the posterior roots and the posterior columns of the cord. Marinesco (l. c.) also accepts the view favoring the spinal ganglia as the seat of the origin of the tabetic lesions. Recently Babès and Remnitzer, according to a brief abstract in the *Gazette Hebdomadaire*, number 15, 1897, have examined the spinal ganglia in several cases of tabes. They believe the principal lesions consist of alteration of the lamellæ and cells which constitute the capsule of the nerve cells within the ganglia, and in

[1] Marie: Leçons sur les Maladies de la Moelle.
[2] Oppenheim and Siemerling: Archiv für Psychiatrie, XVIII.
[3] Oppenheim: Berliner klinische Wochenschrift, 1894, p. 689.
[4] Wollenberg: Archiv für Psychiatrie, XXIV.
[5] Stroebe: Centralblatt für allg. Path. u. path. Anat., 1894, p. 853.

destruction of the nerve reticulum in the capsule of these cells. The changes in the chromatophilic elements and the pigmentation they regard as of less importance. The original paper in the *Archives des Sciences Médicales* has not been accessible to me. Goldscheider, according to the statements of Leyden,[1] has observed lesions of the cells of the spinal ganglia in tabes.

Redlich has communicated (orally) to the writer a most serious objection to the ganglion theory, and one which is not easily answered. It is well known that each of the cells of the spinal ganglia gives origin to a nerve process which divides into two branches at a short distance from the cell body. One of these passes to the spinal cord; the other, within a nerve bundle, toward the limbs and trunk. In tabes the central processes are degenerated while the peripheral escape. How is it possible to give a satisfactory explanation for this if the primary lesion is in the cell body? Oppenheim has well represented this condition.

Another view which has been put forward by Obersteiner and Redlich[2] is most ingenious, but has called forth much criticism. The posterior roots normally are contracted at their point of entrance into the cord, and the axis cylinders here are deprived of their protective medullary sheaths (see Fig. 8). The contracted appearance is similar to that presented by the optic nerve in its passage through the lamina cribrosa. The fine fibres of the posterior roots, which pass through the zones of Lissauer into the cinerea, are placed superficially at the point where the posterior roots enter the cord, and surround the roots like a mantle. They are, therefore, more exposed to the unfavorable results of direct pressure caused by this contraction. This contraction of the posterior roots at their point of entrance is greatest in the lumbo-thoracic and cervical regions, and least in the upper and middle thoracic. In tabes the spinal roots in the thoracic portion of the cord are not infrequently unaffected. Obersteiner and Redlich claim that they could notice in cases not too far advanced that the extramedullary portion of the posterior roots was less affected than the intramedullary, and that the difference began at the point of contraction. In tabes meningitis and thickened vessels are found at the point of contraction, and in this way increased pressure is caused at the point of least resistance. Obersteiner and Redlich claim that the meningitis in tabes may be overlooked in transverse sections, but in longitudinal, especially in those made in a direction which they describe, and which passes directly through the posterior roots, the meningitis may constantly be found. This is a chronic hyperplasia of connective tissue, and the tissue later contracts. The changes in the extramedullary portion of the roots in tabes are retrograde, as are also the slight changes in the cells of the spinal ganglia. The lancinating pains are due to compression of the posterior roots at these points of con-

[1] Leyden: Zeitschrift für klinische Medicin, XXV.

[2] Obersteiner and Redlich: Arbeiten aus dem Institut für Anatomie und Physiologie etc., II.

traction. These writers refer to the well-known predilection of the syphilitic disease for the connective tissue and vessels.

This theory has called forth much criticism, and Nageotte[1] in his report of a case of tabes, affecting only certain of the fibres of two spinal roots, has attempted to show that the absence of myelin sheaths at the point of entrance of the posterior spinal roots into the cord, and the contraction of the roots are post-mortem changes, and due to retraction of tissue. He, himself, has advanced a very different theory in attempting to show the close relation histologically between tabes and general paresis. The important lesion in the latter, according to Raymond, is an accumulation of embryonic cells about the capillaries of the brain. Nageotte began his investigations with the purpose of establishing the existence of a similar lesion in tabes and of finding some unrecognized syphilitic process, which by its situation might cause degeneration of the posterior roots. He rejects entirely the Obersteiner-Redlich theory. He has found in cases of tabes a perineuritis and mesoneuritis of the posterior spinal roots, exactly limited to the portion between the spinal ganglia and the entrance of the roots into the arachnoid cavity, at a point where the anterior and posterior roots are united. There is first of all an infiltration of embryonic cells in this region, which terminates in the formation of connective tissue. This condition may easily escape detection if serial sections are not made, for the portion of the root which may be the seat of the tabetic lesion is only about 10 to 15 mm. long in the sacral portion of the cord. This neuritis acts by compression and irritation of the nerve fibres. The fibres of the anterior roots are also affected at this part, but they appear to be more resistant than those of the posterior, although possibly a descending motor neuritis may be produced. The same lesions may be found in cases of tabes associated with general paresis.

The author has been permitted to study the preparations on which Obersteiner and Redlich, and Nageotte have founded their opinions, and it is of course useless to say that the lesions described by these writers were easily observed. The only question which could arise would be in regard to the deductions made from the findings. Obersteiner,[2] in his reply to some of the objections advanced against the theory proposed by himself and Redlich, states that he has found the lesions described by Nageotte in cases of tabes, but says it is the same process which may be seen in the pia at the point of entrance of the posterior roots into the cord, and is of secondary importance.

Tabes is by no means limited to the spinal cord; it is a cerebro-spinal disease. The spinal roots of the fifth nerves (descending roots) and the descending glosso-pharyngeal roots are sometimes degenerated. The optic nerve is so often affected that I need merely refer to the fact. Nu-

[1] Nageotte: Revue Neurologique, 1895.

[2] Obersteiner: Arbeiten aus dem Institut für Anatomie u. Physiologie, etc., III.

merous observations have shown that when this nerve is degenerated early in the tabetic process the course of the disease is greatly modified or often arrested. Gowers[1] has described a patient in whom optic atrophy preceded the other symptoms of the disease for twenty years. Destruction of nerve fibres in the cerebral cortex has also been observed in tabes (Jendrassik), but the suspicion naturally arises that the cortical process is one belonging to general paresis, which is so frequently associated with tabes. Marie (l. c.) says cortical changes are not uncommon in tabes, even when there have been no symptoms of paresis. The spinal lesions of tabes are not secondary to the cortical, though they are doubtless due to the same cause.

The nature of the ocular palsies and laryngeal crises in tabes has never been clearly demonstrated. They have been supposed by some to be nuclear, by others neural, in origin. Dejerine and Petreen[2] have examined a case of tabes with paralysis of ocular muscles and laryngeal crises, and have found peripheral neuritis as the cause of these symptoms. They were not able to employ the method of Nissl, but the cells appeared to be normal with the carmin stain.

Obersteiner[3] has published the results of his examination of the tongue in a case of tabes with unilateral lingual atrophy. Cassirer, who studied the central nervous system of this case, stained some sections of the tongue by the method of Marchi with most brilliant results. The lesions are most interesting, as the author can testify from an examination of specimens given him by Cassirer. In longitudinal and transverse sections, as described by Obersteiner, numerous small black dots, consisting of fat stained black by the osmic acid, may be seen within the muscular fibres. The pictures in Obersteiner's paper well represent the condition. Notwithstanding careful examination, no change could be found in the twelfth nucleus, but nerve fibres within the tongue presented signs of a distinct, though moderate, degeneration. Cases of unilateral atrophy of the tongue with lesions in the corresponding twelfth nucleus have been reported by Raymond and Artaud,[4] Westphal,[5] Koch and Marie.[6]

Some writers have thought that the posterior sclerosis of tabes is caused by disease of the vessels. This theory has not gained many advocates.

The involvement of the peripheral nerves in tabes has been a disputed question. In some cases of tabes extreme muscular atrophy of the extremities occurs. Charcot and Pierret[7] published the first case of this kind with alteration of the cells of the anterior horns. This was followed

---

[1] Gowers: A Manual and Atlas of Medical Ophthalmoscopy, p. 192.

[2] Dejerine and Petreen: Comptes Rendus des Séances de la Soc. de Biologie, 1896.

[3] Obersteiner: Arbeiten aus dem Institut für Anatomie u. Physiologie, etc., III.

[4] Raymond and Artaud: Arch. de Phys. norm. et path., 1884, p. 367.

[5] Westphal: Archiv für Psychiatrie, XVIII.

[6] Koch and Marie: Revue de Médecine, January, 1888.

[7] Charcot and Pierret: Comptes Rendus des Séances de la Soc. de Biologie, 1871. Arch. de Phys. norm. et pathol., 1870.

by the report of a case by Leyden.[1] Condoleon[2] also published a case of tabetic atrophy in which the anterior spinal cells were less numerous, but peripheral neuritis was also found in his case. The spinal motor cells may be affected in some cases of tabes, at least when examined by the method of Nissl, as Schaffer[3] and Marinesco[4] have shown.

In 1888 Dejerine reported the results of his study of five cases of tabetic atrophy with autopsies, and later he published four more. In all these cases he observed intense lesions of the motor nerves with integrity of the motor cells, and he believes this tabetic atrophy is due to peripheral neuritis. These statements of Dejerine have been confirmed by Nonne. In his paper Dejerine[5] also reported ten cases of tabetic atrophy without autopsies. Previous to the publication of this paper by Dejerine it had been supposed that the atrophy was the result of anterior poliomyelitis, on account of the cases published by Charcot and Pierret, and Leyden. Condoleon's case was capable of other interpretation. Dejerine regards the case of Charcot and Pierret as one of tabes associated with subacute spinal paralysis, chiefly on account of the clinical history; and the case of Leyden as one of tabes with chronic progressive muscular atrophy, and not as one of *tabetic* muscular atrophy. Dejerine has also spoken of sensory neuritis in tabes, and has been supported in these statements by Leyden. The tabetic muscular atrophy is a late sign of the disease, and begins in the peripheral part of the limbs (Dejerine).

The possibility of the commencement of tabes in peripheral neuritis has been regarded with favor by some, and with disapproval by others. There are some cases which may be brought forward in evidence of such an origin, but apparently these are not very numerous. The case of interstitial, hypertrophic, and progressive neuritis of childhood, with autopsy, published by Dejerine and Sottas,[6] might be regarded as of weight in deciding this question. The patient had degeneration of the peripheral nerves of an intense, and of the spinal roots of a less marked, degree, with the ordinary lesions of tabes in the cord. The spinal ganglia were also affected. The process was regarded by the authors as an ascending one. It would appear from this case that an ascending degeneration does not always stop at the spinal ganglia, but may involve the posterior columns through the posterior spinal roots. It is not my intention to convey the impression that this was a case of tabes, for it presented symptoms which are not observed in tabes. Peripheral neurotabes, described by Dejerine, is a very different disease from true tabes, and while it is a neuritis, it may not be used as an argument in favor of the peripheral origin of tabes.

The following quotation is taken from the report of some remarks

[1] Leyden: Deutsche Zeitschrift für praktische Medicin, 1887.
[2] Condoleon: Thèse, Paris, 1887.
[3] Schaffer: Revue Neurologique, 1896.
[4] Marinesco: Revue Neurologique, 1896.
[5] Dejerine : Sur l'Atrophie Musculaire des Ataxiques.
[6] Dejerine and Sottas : Mémoires de la Soc. de Biologie, 1893.

made by Flatau in the *Verein für innere Medicin*, March 29, 1897 (*Berliner klinische Wochenschrift*, Number 15, 1897, p. 327). "Until the present time it has been thought that degeneration due to a traumatic lesion of the peripheral sensory nerve fibres cannot pass the spinal ganglia, but the investigations of Lugano have demonstrated that the cells of the spinal ganglia are altered in such lesions. Redlich found degeneration of the posterior roots and of the fibres in the posterior columns in guinea pigs, five to ten weeks after amputation, and Darkschewitsch has recently published a large work in which the same fact is clearly shown." In the second case reported by Flatau at this meeting (amputation of the left leg; tumor of the cauda equina; death three months after the amputation) degeneration of the posterior columns from pressure of the tumor on the sacral roots was found, and in addition to this there was another degenerated area in the middle and upper lumbar regions, though only on the side of the amputation, and the reflex collaterals were degenerated. "All these facts," says Flatau, "have a certain bearing on the theories of tabes. v. Leyden has thought the peripheral sensory nerves form the starting point of the process, contrary to the opinion of Marie, who places the primary lesion of tabes in the spinal ganglia. The facts above mentioned point to the possibility of extension of the degeneration from the periphery over the entire sensory neurone."

The posterior columns are vulnerable to poisons, and this seems to be especially true of the toxin of diphtheria (Bikeles, Priesz, quoted by Redlich[1]). Anyone who reads the reported cases of polyneuritis with involvement of the posterior roots, and secondary degeneration in the posterior columns, due to alcohol or other poisons, must be struck by the similarity of these lesions with the tabetic. If we accept the views of Pal[2] and Redlich (l. c.) these cases offer no support for the theory of the origin of tabes in peripheral neuritis. These writers believe that the affection of the posterior roots is not secondary, but that the poison acts both on the roots and peripheral nerves. Oppenheim[3] recently asked why it is that polyneuritis does not often cause the lesions of tabes if the latter has its origin in the peripheral nerves, and v. Leyden replied that the multiple neuritis is an acute or subacute disease, which usually ends in recovery, and the sensory fibres are entirely restored. Goldscheider likewise stated that he had examined two cases of chronic neuritis, in which changes had been found in the spinal cord similar to those of tabes, and that he regarded the origin of the tabetic process in the peripheral nerves as possible.

Certain authors have looked upon trauma as an etiological factor in tabes, and Hitzig in 1894 devoted a monograph to this subject. Morton Prince, Bernhardt, and Mendel do not willingly accept this as a cause. It

[1] Redlich: Contralblatt für allg. Path. u. path. Anat., 1896, p. 985.

[2] Pal: Wiener medizinische Blätter, 1894, p. 574.

[3] Oppenheim, v. Leyden, Goldscheider: Munchener med. Wochenschrift, no. 16, 1897, p. 430.

is difficult to understand the *modus operandi* in which trauma could affect the posterior roots alone.

The view that syphilis acts indirectly on the posterior roots and causes the degeneration of tabes receives confirmation from the studies of Tuczek[1] and Walker[2] on ergot poisoning. Redlich[3] also acknowledges that the lesions described by Tuczek in ergot poisoning are very similar to those of tabes, though he remarks on the absence of degeneration in Lissauer's zones. Pineles,[4] however, states that these areas are not degenerated in all cases of tabes.

THE TREATMENT OF CARCINOMA OF THE UTERUS, AND OVARIAN DISEASE, WITHOUT OPERATION.

BY ROBERT BELL, M.D., F.F.P.S.G.,

Senior Physician to the Glasgow Hospital for Diseases Peculiar to Women.

A MOST interesting statement has recently been made by Snow to the effect that hypodermic injections of morphine and cocaine, delay, if they do not actually prevent, recurrence of scirrhus after operation. If this is a fact, one is warranted in inferring that certain agents which are safe therapeutic remedies may be discovered to produce destructive effects upon morbid growths, where these have established a habitat in a debilitated tissue. My experience during the past two years has fully confirmed this statement and inference, as a considerable number of instances have come under my observation where epithelioma of the cervix has completely disappeared under local treatment, the object of which has been to promote a healthier condition of the organ, while, for reasons which I have before stated, this has been supplemented by the administration of thyroid extract. The local treatment consists in removing by the curette all the unhealthy tissue that can be reached, and the application afterwards, at frequent intervals, of tampons saturated with a ten-per-cent. solution of ichthyol in glycerine.

It is not, however, to be inferred that every case so treated is followed by a favorable result, yet, in the majority of instances where the disease is in its initial stage and has not involved any other tissue than the cervix itself, one may calculate upon a most encouraging result. It would appear that this method of treatment contains all the elements of success which can be claimed by complete hysterectomy. Nay, more, in a few instances where the disease has actually proceeded beyond the sphere of surgical influence, complete recovery has followed this method of treatment.

[1] Tuczek: Archiv für Psychiatrie, XIII., XVIII.
[2] Walker: Archiv für Psychiatrie, XXV.
[3] Redlich: Centralblatt für allg. Path. und path. Anat. 1896, p. 985.
[4] Pineles: Arbeiten aus dem Institut für Anatomie u. Physiologie, etc., IV.

In studying what has been written on the pathology of cancer, such a variety of opinion has been found that it is difficult to arrive at any accurate conclusion on this important subject. It stands to reason, however, that before cells depart from their normal, and take on a malignant development, the subjacent tissue must have become enfeebled, and this fact would appear to have been recognized by pathologists who have designated this enfeebled condition "the pre-cancerous tissue." Why it should receive this designation it is difficult to comprehend, as it is not a necessity of this condition that cancer should supervene. My reason for taking exception to this is that, by judicious treatment, the unhealthy features can be removed and malignancy thereby averted. In epithelioma, for example, this debility may have acted as a stimulus to the lower organized epithelium cells, which of themselves have been the direct result of the unhealthy mucous membrane. We are fully aware that when the cell growth of either the epithelium or endothelium is excited by an irritant or by enfeeblement of the subjacent membranes, a remarkable proliferation of immature cells is the result and that these tend to be thrown off in considerable quantity, giving rise to catarrh. If the altered cells, however, are retained in closed follicles or in *culs des sacs*, having a narrow calibre like those of the utricular glands, it is not difficult to conceive that they may become implanted on the surface of the glands and may proceed to a further pernicious development. They thus pass from a benign to a malignant state of existence and commence to prey upon their environment, and, after still further prostrating the already enfeebled tissue, progressively infiltrate it and manifest their character of malignancy.

Now, approaching the subject of diagnosis, one cannot avoid being impressed by the great diversity of opinion which would appear to exist on this point. Numerous instances are on record where eminent pathologists, examining one specimen, have differed in the conclusions arrived at after careful study. One has proclaimed a neoplasm to be malignant, whilst another affirms that the tumor is benign. One author, in an interesting contribution on "The Nature and Treatment of Malignant Neoplasms" protests against microscopic examination before operation, believing that the preliminary cutting of the tumor might cause a rapid change or an escape of cells that will infiltrate new tissue and perhaps be the cause of recurrence. He further insists that microscopic examination should be made after removal and recorded for future guidance. He goes on to remark that, could surgeons see microscopically all the small tumors they have thrown away without examination, there would probably be a vastly greater percentage of malignant growths found among them than is generally supposed. *Per contra*, I am satisfied that a great many operations, especially upon the uterus, are performed for so-called malignant disease when this has no existence; *e. g.*, one writer affirms that if the os is discovered to be eroded and redder than normal, with an unhealthy discharge escaping,

and if this discharge be wiped away on a pledget of wool and observed to be purulent in its nature, and if it seem watery and perhaps blood stained, the case is highly suspicious of cancer. Further, that if the discharge has a faint disagreeable odor and further examination with the uterine sound denotes that the canal is increased in length and that the manipulation of the instrument causes bleeding, he says we may be pretty certain that we have to deal with a cancerous uterus. For the purpose of making the diagnosis clearer he recommends that the patient should be placed under an anesthetic, the uterine canal fully dilated, and by means of the curette a scraping of the cavity be obtained for pathological examination. Here, however, he suggests that we may be beset with difficulties, these arising from the fact that a portion of healthy tissue may be removed, when of course the pathological report would be fallacious. (I may here state that if my dredge curette were employed in such circumstances no mistake of this nature could possibly arise.) But I maintain that if the microscopical search be still further proceeded with, by a pathologist or pathologists thoroughly competent, difficulties would still crop up to prevent one arriving at a correct conclusion. My reason for making this statement is that, when endometritis has existed for a lengthened period the endometrium becomes so altered in character (frequently assuming a granular or papillomatous condition) that it gives rise to all the symptoms above enumerated. Were these symptoms diagnostic of cancer, then I would be in the happy position of having treated innumerable cases of this dreadful disease with perfect success, and this without having recourse to anything further than the free employment of the curette, followed by a few weeks of intra-uterine medication and constitutional treatment. There is one symptom, however, which has been enumerated which I look upon as almost pathognomonic of cancer of the uterus, namely, a persistent fetid odor of the muco-purulent sanguineous or sanguino-purulent discharge. Notwithstanding the fact that these symptoms may obtain, and furthermore that the patient has become cachectic and lost considerably in flesh, I hold that the disease is still amenable to treatment without having recourse to the serious operation of hysterectomy. Extensive observations on this subject have taught me that the only form of cancer which takes its origin in the uterus is epithelioma, and, although I am in the habit of seeing daily a considerable number of cases of uterine disease, I have never yet come across one case of malignant adenoma or of scirrhus affecting this organ. Yet it is recorded in a recent number of the *British Medical Journal* that one operator out of three cases pronounced two of them to be "scirrhus." I can only look upon these as being instances of error in diagnosis; the probability is that they consisted of fibromatous interstitial nodules which gave rise to the symptoms suggestive of cancer. If scirrhus is ever met with in the uterus, then I would conclude that it has risen from metastasis and would therefore not

be amendable to operation. I could quite as readily conceive of scirrhus appearing as a primary disease on the tongue, lips, or rectum.

The natural history of epithelioma differs materially from that of scirrhus; the former invariably attacks a tissue which has been debilitated by pre-existing diseases and in its structure is closely allied to the tissue from which it originates; scirrhus, on the other hand, manifests itself in the majority of instances in tissues where there has been entire absence of indications which would lead one to prognosticate its advent. Moreover, there are sufficient grounds for supposing that scirrhus is the result of a transmigration of a cell or cells foreign to the part which is attacked. (This is a point in the pathology of cancer which must necessarily be left for discussion at a future period.) Epithelioma, therefore, would seem to be the result, in the first instance, of an aberrated condition of the matrix of the epithelium, the consequence being that abnormal instead of normal cells are generated and their proliferation increased *pro rata*. The same symptoms are manifested in myxedema which is invariably accompanied by metrorrhagia to a greater or less extent. When this disease is treated by means of thyroid gland the epithelium is restored to health and, as a consequence, the hemorrhage ceases.

The relation which exists between the thyroid body and the genital organs (if one is to credit Catulle's statement) was well known to the ancients. It has also been demonstrated that pregnancy when accompanied by hypertrophy of the thyroid body sometimes favored the regression of a pre-existing thyroid tumor; Professor Charcot, having seen women affected with exophthalmic goitre cured after pregnancy, did not fail to advise it on therapeutic grounds in the treatment of this painful affection. (My experience, however, is that women suffering from goitre have been less prone to become pregnant than other women.) The relationship between the thyroid body and the uterus is affirmed in a more decisive manner by certain singular facts observed by MM. Bouilly, Tuffier, Guinard, Picqué, and Bloch, these surgeons, having had to operate on patients affected by fibroma of the uterus or salpingo-oöphoritis in whom co-existed goitres, some of which had previously resisted all treatment, have seen thyroid tumors disappear, or at least be considerably diminished, after the extirpation of the pelvic organs.

If now we study the etiology of cancer of the uterus, for example, we find among the predisposing causes all those which can contribute to depress the vitality of the organ. I refer specially to repeated attacks of metritis, but more especially endometritis resulting either from idiopathic or traumatic causes. If we bear in mind, therefore, the pathological relationship of the thyroid body to the womb, we may readily admit that the vitality of the latter may depend, to a large extent, on the integrity of the thyroid function. One is much more inclined to favor this opinion when we study the results which many authors have obtained who have had a

large experience in the treatment of myxedema, and who testify to the fact which I have just stated, that their cases have been frequently accompanied by metrorrhagia. It is these considerations which prompted me, in the first instance, to treat cancer of the uterus by the ingestion of fresh thyroid gland. It must be understood, however, that the local treatment mentioned in the beginning of this article, which consists in carefully curetting the diseased tissue and afterwards applying tampons saturated in a ten per cent. solution of ichthyol in glycerine, at least bi-weekly, is not to be neglected. Of course I do not for a moment maintain that this method of treatment is a panacea, what I maintain is that it is a remedy which deserves to be placed on record, and which will prove quite as reliable as the majority of remedies for other diseases. When the disease has been in its initial stage the results have been more than satisfactory, and in several instances, even where considerable inroads had been made and where a favorable result could hardly be expected, the parts have been restored to their normal condition. My argument is that where surgical interference can be of avail this therapeutic method of treatment is almost certain of success, so that the ultimate condition of the patient is very much more satisfactory than if hysterectomy had been performed, while all the risks and anxiety of the operation have been avoided.

The treatment of ovarian and tubal diseases, as also that of fibroma of the uterus by means of parotid and mammary gland, has been suggested by the physiological relationship which exists between these organs. The effect of parotid gland upon a diseased ovary is so pronounced, especially if the uterine affection is simultaneously treated, that it would be wrong, in my opinion, not to employ this remedy before resorting to operation. During the past two years I have obtained most favorable results in over 60 cases of enlarged and painful ovaries, which would certainly at one time have warranted oöphorectomy. These women are, at the present moment, not only perfectly well and free from pain, but, what is equally satisfactory, they remain also in possession of their ovaries.

It would be perfectly easy to illustrate this paper by numerous cases proving what I have stated, but it appears to me quite unnecessary to do so. I will therefore conclude by giving extracts from an American and from a French paper which will demonstrate the manner in which a previous communication of mine on the subject has been received. The first is from the *Pacific Medical Journal* which, in an editorial headed "Cancer Cure," says: "If the following statement came from an obscure physician, we would not give it a second thought, but coming, as it does, from Dr. Robert Bell, of Glasgow, the astounding statement must be treated with respect." He then goes on to quote a portion of my paper, and concludes: "A cure for cancer is what we are constantly expecting; 'Hope springs eternal in the human breast' and so does cancer. The former will sustain us in our efforts until we finally triumph over the latter." The next quotation which I give is

from a French journal, of which I give a translation: "I have found that in uterine hemorrhages of a cancerous origin, thyroid elixir has sometimes acted with wonderful effect. At the *Institute St. Camille* we treated an English lady who had had severe metrorrhagia for several weeks. After she was put upon thyroid elixir the hemorrhage became less, day by day. In another case I saw the hemorrhage stopped, the pain lessened, and the weight increased during the weeks occupied in the cure." Here are quotations from the pens of two medical men, one who has *not* tried the remedy, and the other who *has;* I leave the reader to judge which had the best right to speak.

Curiously enough, about the same time that this number of the *Pacific Medical Journal* was published, I received a letter from a lady medical practitioner in San Francisco, who had written to me some time before, asking me to instruct a Glasgow druggist to forward a quantity of Mammary Gland Palatinoids, so that the remedy might be tested on a case of fibroma. The result has been so satisfactory that she wrote again about a month ago to inquire where she could get a larger supply, as she wished to employ the remedy on a number of similar cases.

RANDOM NOTES ON THE SECOND PAN-AMERICAN MEDICAL CONGRESS, HELD AT THE CITY OF MEXICO, NOVEMBER 16, 17, 18, AND 19, 1896.

BY DAVID CERNA, M.D., PH.D.,

A delegate from the *Texas State Medical Association;* Demonstrator of Physiology and Lecturer on the History of Medicine in the Medical Department of the University of Texas, etc.

ASIDE from its social features, which by their number and excellence reflect great credit on the government, municipal authorities, and citizens of Mexico, the second Pan-American Medical Congress was a most pronounced success from a scientific standpoint.

Fifteen countries were represented by official delegates, the registered attendance being over 460, even larger than that at Washington in 1893; larger indeed than was anticipated, considering the hard times in financial circles, and the long distances that must be spanned before arriving at the place of meeting.

Of the physicians in attendance by far the larger proportion were Mexicans. The United States furnished a considerable number of delegates, noticeable among whom were William Pepper and Roland G. Curtin, of Philadelphia; Charles A. L. Reed and Robert Sattler, of Cincinnati; Albert Van der Veer, J. D. Spencer, and A. Walter Suiter, of New York; Irving A. Watson, of New Hampshire; J. F. McShane, of Maryland; Walter Wyman, of the United States Marine Hospital Service; J.

Frank, of Chicago; A. P. Clark, of Massachusetts; Calvin DeWitt and others, of the United States Army Medical Department, etc., etc. There was an especially large delegation from Texas, and of these I noticed J. W. McLaughlin, of Austin, and P. C. Coleman, of Colorado City, both ex-presidents of the State Medical Association; S. E. Hudson, of Austin; R. Hodges, of Houston; A. E. Spohn, of Corpus Christi, and many others. Canada also sent an array of distinguished physicians, among whom I saw A. D. Blackadder, and E. P. Lachapelle, ex-president of the American Public Health Association, both of Montreal; also Drs. E. P. Benoit, J. E. Cameron, and N. Stewart. Several lady physicians also were in attendance, among them Emma Culbertson, of Massachusetts, and Matilde Montoya, of Mexico.

All the sections were well attended. Many of the papers presented were of an elevated scientific character, and the discussions were interesting and, in many instances, highly instructive. It will be almost impossible, however, to give a detailed account of all the scientific work accomplished; suffice it to say, that this surpassed all expectations. Indeed, the meeting of the second Pan-American Medical Congress at the City of Mexico showed conclusively that the ideas still quite extensively entertained in the countries north of the Rio Grande (particularly the United States), in regard to the standing of Latin-American medicine and physicians, are in the main erroneous. *Apropos* of this matter, the statements published somewhere as emanating from Dr. J. Frank, a prominent surgeon of Chicago, may be quoted here. Dr. Frank expressed himself to a reporter of a Mexican newspaper as follows:

"In regard to my visit to the San Andres Hospital, I am very much impressed with the cleanliness and thorough equipment of the institution, and concerning the instruments and the surgical appliances which I have found in use in this country, I feel satisfied that the science of surgery is making headway in Mexico. I am very much impressed with the attention and application displayed by students in general, and by the evident desire on the part of all connected with the science of healing to become acquainted with and adopt all modern ideas and appliances in use in other countries. Mexican medical men are fully up to the times, and I have seen enough of their work in different operations which I have witnessed here, to feel called upon to pay this tribute to their skill.

"I am highly gratified at the widespread interest displayed by the Mexican medical men, both physicians and students, in the deliberations of the Congress, this being evident not only among medical men, but among the public at large, judging by the large attendances at almost all the sessions of the different sections.

"In conclusion, I wish to express to my Mexican *confrères* and to the Mexican people in general, my warm appreciation of their kindly courtesies and attentions to myself and my brother delegates. I have most thor-

oughly enjoyed my visit to this country, and greatly regret that the calls from the fields of duty at home are so urgent as to make it impossible for me to enjoy the hospitality of this genial people for a longer time, and to explore all the points of interest in a country so replete with historical associations and traditions. At no medical Congress that I have attended, either in the United States or Europe, have the delegates been received with one-tenth of the lavish and unwearying hospitality that Mexico has displayed to her guests on this occasion."

The above is but an example of the sentiments expressed by most of the American and Canadian physicians present at the congress.

The sections most largely attended were those on "General Medicine, including Pathology and Therapeutics," "General Surgery, including Orthopedic Surgery," and "Obstetrics, including Gynecology and Abdominal Surgery." I shall endeavor to give abstracts of some of the most interesting works presented in the different sections, especially in the three mentioned above.

Section of "General Medicine, Pathology, and Therapeutics."

An interesting paper on "Pernicious Malaria" was read by Dr. Richard R. L. Bibb, formerly of Texas, but now of Saltillo, Mexico. Dr. Bibb believes that the crescentic forms of the plasmodial organisms are peculiar to pernicious malarial fever, since they are never or very seldom found in the blood of patients suffering from an acute type of the disease. Hence, in a given case of paludal intoxication, in which the crescentic protozoa of Laveran have been found, the physician should be on guard as to the outcome, for in these instances strong suspicion as to the existence of a pernicious form of malaria must be entertained. The paper was discussed extensively by Dr. José Terrés, of Mexico. This gentleman expressed views entirely opposed to those held by Dr. Bibb. And *apropos* of the same subject, Dr. Terrés then read an essay, entitled "Facts of Practical Utility Respecting Paludal Fevers."

Terrés says that there is no appreciable difference in either the quantity or form in which the parasites are found in the digital blood of the patient, no matter at what period of disease the examination is made, that is to say, the hematozoa are found equally during the access of the fever, shortly after its appearance, in full apyrexia, or shortly before the access comes on. In malarial cachexia, and when the accesses are not periodical, the plasmodia are scarcer, and the crescentic forms, as well as the free pigment, are then abundant. He has insisted for several years past that it is of the greatest importance, in order to make a correct diagnosis, to find in the blood granules, whether free or not, of dark coffee-colored pigment. This pigment is pathognomonic of the disease in question, for that which results from the common breaking down of the red corpuscles is of a very light

coffee-color, really yellow, while the pigment of melanotic tumors is rarely found in the blood. Therefore, as the finding of the pigment is easier than the distinguishing of the plasmodia, the author considers that searching for the former, rather than for the latter, is more useful and practical, especially for those physicians who are not expert with the microscope. The examination ought always to be made with an instrument given an amplification of 700.

Two years after Terrés' observations, Risquez, of Venezuela, made similar statements in regard to the pigment, and was satisfied with a microscope of less than one-half of this power. Risquez said, moreover, that the pigment is black and that it is only found in cases of paludism. Terrés does not entirely agree with any of these three latter propositions.

According to Terrés, the administration of quinine to the patient causes the disappearance of the hematozoa from the blood, but only after the disease is cured, and in such cases the drug removes them two days after the beginning of the dosage; on the day of the dosage immovable forms are seen, which are almost always of an irregular shape.

The hematozoa, multiplying but slightly, can live for a long time in the blood, their presence not being made manifest. Ordinarily, however, their presence is demonstrated by a destruction of blood corpuscles, and hence the malarial anemia which comes on without any access of fever. This anemia, which depends really on the action of the parasites, is the immediate cause of neuralgia.

It is probable that they act directly, or by means of their by-products, on the nervous system, and thus favor the production of the neuralgic forms of masked or larvated paludal fevers.

When a patient whose blood contains, or is supposed to contain hematozoa, is about to suffer an access of the disease, he can avoid it by taking, two days previously, the dose of quinine which, in that special locality, prevents the access. This is, according to the author, an important factor to bear in mind for the application of hydrotherapy in the treatment of malarial anemia.

Contrary to what is believed by Burdel, Terrés has not seen any glycosuria following the accesses of paludal intoxication, even after administering 150 grammes of syrup to the patients. Quinine ought to be administered after the correct diagnosis has been made. The belief that the drug should be given any specific number of hours before the attack is erroneous.

Quite an interesting memoir was presented by Drs. E. Acosta and J. M. Dávalos, of Havana, Cuba, on the subject of "Urine in Yellow Fever."

The authors of this paper have for a long time devoted special attention to the study of this disease, and now present the results of an experimental examination of the urine of yellow fever patients. They have studied the toxic power of the urine and carried out more than one hun-

dred experiments on rabbits. From their observations they have been able to infer that: 1. The urine of yellow fever patients contains toxins which are separated by the diseased system, which toxins belong, perhaps, to the germ that causes the disorder. 2. The toxic power of these urines reveals the actual or real condition of the patient, so much so that the toxic power in question is in inverse ratio to the gravity of the disease. This is explained by the fact that when there is less toxin in the patient's system, he improves because the lethal principle has been carried off by the urine; while, on the other hand, when the urine is not toxic the toxin matters accumulate in the system, increasing the gravity of the situation. 3. The quantity of urine has nothing whatever to do with the prognosis of yellow fever, as the labors of Bouchard have demonstrated with respect to other maladies, and as has been apparently proved, with regard to yellow fever, by the authors of the paper. From the analyses that have been made of urine, the present investigators have proved almost conclusively that serious cases eliminated a good deal of urea, whilst in comparatively mild cases this nitrogenous waste product was stored up in great quantities within the system. Acosta and Dávalos have, by experiment, proved that rabbits inoculated by an intravenous injection of urine largely charged with urea, lived longer than other animals of the same class which were injected with urine containing little urea.

The authors show, finally, that yellow fever patients die through poisoning by means of toxins or by-products of the germ which produces the disease, and never from uremia.

Germane to the same subject was the paper entitled, "Biological Characteristics of the Blood in Yellow Fever," read by Dr. Thomas Vicente Coronado, also of Havana. The author has had occasion to study the matter extensively. The arrival, within a short period of time, of more than 150,000 men who were not acclimated and who came from the mother country to perform military duties, has intensified yellow fever and greatly disseminated the germ from one end to the other of the island of Cuba. The succession of cases, among Europeans as well as native born Cubans who had not obtained immunity through a previous attack, has afforded the author a vast field within which to carry on hematological studies.

According to Coronado, the technique for collecting the blood and preserving it in good condition for study is very simple, and similar to that which he employs in examining malarial patients. A finger of the hand is thoroughly cleansed and made aseptic, and pricked with a common needle or with a lancet which has been previously sterilized by heat. The blood is collected in small glass vessels which are made for the purpose by means of a blow pipe, so as to leave them with a long sharp neck. This can be broken with the finger nail and can, after filling, be closed with the flame of a match. Blood, collected in this manner, can be preserved in good condition for one or more days. The examination can be made by emptying

a part of the blood on a glass slide. The permanent preparations must be made by the method of double staining with eosin and methylene blue. The blood is spread on the slide in a very thin coat, making a mixture with equal parts of absolute alcohol and ether, to be afterwards washed and dried and then mounted in Canada balsam.

In serious cases of yellow fever, when a fatal result has taken place a few hours after the extraction of the blood, as well as in milder cases, and throughout very large numbers of observations, the examinations have given unexpectedly *negative* results. In fact, it has surprised the author to find that the blood of yellow fever patients under the circumstances mentioned, should present all the features of a normal blood. It is, therefore, evident that the blood is not the seat of the disturbance peculiar to the terrible malady in question. Coronado asserts that all persons, native or foreign, that have not been immunized by a previous attack, suffer alike from the effects of yellow fever.

Both articles were then extensively discussed by Drs. Mendizábal and Mejía, of Mexico. Dr. Mendizábal thought it was of the greatest importance to search for the toxins rather than for any changes in the urine. Dr. Mejía believed that in yellow fever *urinemia* and *not* uremia, was the cause of death.

(To be continued.)

A CASE OF TETANUS: TREATED WITH ANTITOXIN, CHLORAL, AND CALABAR BEAN: RECOVERY.

SERVICE OF DR. JOHN ASHHURST, JR., AT THE HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA.

BY HORATIO C. WOOD, JR., M.D.,

Resident Surgeon, University Hospital.

THE following report is that of a case of tetanus, in which the patient was a boy, and which was treated successfully at the hospital of the University of Pennsylvania.

L. C., aged seven years, was admitted to the University Hospital, January 14, 1897. The following history was elicited:

Eleven days previously he fell on a rusty nail, suffering a punctured wound in the palm of the right hand. The wound was at first dressed with a solution of potassium permanganate, later with a carbolic acid solution. It did very well for a week, but at the end of this time he commenced to complain of soreness in the hand, and the eighth day a single incision was made through the

wound, an antiseptic dressing being applied. On the evening of the ninth day the mother noted that he was more nervous and fretful than usual. The next day the restlessness was more marked and the patient complained of difficulty in swallowing. Toward evening this difficulty increased to such an extent that he refused nourishment; there had also developed some stiffness of the jaws, rendering mastication difficult. The next morning (the eleventh day since the injury), these symptoms had increased and a slight rigidity of the neck was also noticed. The patient was admitted to the University Hospital late that afternoon under the care of Dr. Ashhurst. At the time of admission the temperature (in the axilla) was 99° F., pulse 120; the patient was very nervous, could only partially open the jaws, the neck was rigid, there were some convulsive movements, which were not very well marked save in the muscles of the face; the right hand was flexed at the wrist and the fingers were closed. Dr. J. P. C. Griffith, who saw the case in consultation, advised the use of the antitoxin. Accordingly the patient was given an injection of 10 c.c. of the Pasteur Institute tetanus antitoxin, without any peculiar phenomena as a result. A V-shaped incision was then made above the wound, severing all afferent nerve filaments, and an antiseptic dressing applied, the hand being placed on a splint. The medicinal treatment was as follows: choral, gr. v every 2 hours, potassium bromide, gr. vii every 2 hours, extract of physostigma, gr. $\frac{1}{3}$ every 4 hours, tincture of opium, drops iv three times a day. The patient slept most of the night, but at times cried out and became rigid. The next day the *risus sardonicus* became more marked and remained a prominent symptom throughout the course of the disease. The choral was increased to 6 gr., the calabar bean to $\frac{1}{6}$ gr., and 1 dram of whiskey every 4 hours was added. The next day, the 13th of the disease, the convulsive seizures were more frequent and more severe; although the muscles of the back were quite rigid, there was no true opisthotonos, nor was it ever well marked; the abdomen was tense and board-like, tender and somewhat distended. The movement of the bowels by an enema seemed to relieve somewhat the abdominal distress. The patient was drowsy and slept most of the time, but at intervals cried out and stiffened the whole body without awakening. These spasms became gradually more frequent, and at the height of the malady occurred as often as twenty times in the course of an hour. As they showed a tendency to recur more frequently just before the time for medicine, it was decided to increase the choral to 7 grs. and the calabar bean to $\frac{1}{5}$ gr., making the total medication in 24 hours, choral, 84 grs., potassium bromide, 84 grs., extract of physostigma, $2\frac{2}{5}$ grs., whiskey, 6 drams. Nothing worthy of note occurred until January 21st, the eighteenth day of the disease, when the temperature rose to $100\frac{4}{5}$° F. in the axilla, the maximum reached in the whole attack. This was perhaps due to constipation, as the temperature gradually returned to normal after the bowels had been well opened. The patient remained constantly in a state of stupor from which he could not be aroused; he did not seem to recognize anyone, but took his nourishment and medicine without trouble. The convulsive seizures from this time on became gradually less frequent, but the *risus sardonicus* was still pronounced and persisted well on into convalescence. On January 25 the following note was made: "Patient has had the best night since he was admitted. No muscular contractions." On January 27 the hand was redressed; the wound was found entirely healed, but the fingers were markedly flexed and attempts at straightening them caused considerable pain. His condition steadily improved, and he was discharged on February 11, the 38th day since the injury. The fingers were almost straight, the only symptom persistent being a slight *risus*, which was rapidly fading.

A POSSIBLE CAUSE OF GOUT.

BY EDWARD WILLARD WATSON, M.D.,
Philadelphia.

PROBABLY many men in general practice have realized of late that gout has become extremely prevalent, especially in its more erratic manifestations. We must, it is true, credit something to fashion in nomenclature; Gout, neuralgia, rheumatism, neuritis, muscular rheumatism, sciatica, pleurodynia, all are more or less included in the modern idea of gout and their victims are said to have the gouty constitution, after that they are under condemnation and their indigestion is "gouty" and their bronchitis and asthma still more "gouty." Even the "Odontists" have caught on and astonish their victims, whose aches they cannot cure, with a new diagnosis, satisfactory and fashionable, of "gout" in the teeth.

In looking for causes, however, for the undoubted increase in gout, we must seek special causes, those which have become more prominent factors in general daily life. Among those possible we might mention the increased consumption of coffee, tea, cocoa, chocolate, and sugar; the use of coal tar remedies so generally; the introduction of the bicycle, influenza, and perhaps poisoning by minute unsuspected quantities of lead.

Coffee is largely increasing its hold on us; we drink it more often, we make it stronger. Tea has perhaps generally fallen off in use, excepting with those devotees of afternoon tea, who are not especially known to suffer from gout, and both tea and coffee in one way, by their action on the skin and renal secretion, would generally be considered rather as adjuvants to the cure of gout than as exciting causes. The use of the bicycle cannot be blamed for causing it, since the large majority of cases do not ride. Influenza is a more serious matter, and it is difficult to deny that its impress, so general upon all ranks and ages, with its marked tendency to bring on attacks of gout in the previously gouty and leave behind painful sequelæ, may have rendered us all gouty; and again, if not by the influenzal poison itself, by the coal tar remedies, the antipyrin, phenacetin, and antifebrin used so extensively in its treatment. But we have left till the last the question of lead, because this paper is written solely to suggest to the professional worker a possible line of investigation. To the writer there seems a possibility that we are all suffering from minute plumbic intoxication, conveyed in our water supply and induced in it by the destruction of our service and house pipes by electrical currents leading from trolley supply wires and return circuits.

Philadelphia has always had more lead pipes in her water service than any other city. Originally it was supposed to be safe for us because the acid existing in the water coated the pipe and rendered it impervious, but it is by no means sure that the water to-day has any such power.

In pursuance of the idea that lead might exist in our water and be a cause of gout, numerous examinations were made, but without entirely satisfactory results; the quantities anticipated would, however, be very minute and still more difficult of detection, from the fact that their appearance would not be constant in respect to either place or time. Negative results therefore do not disprove the hypothesis upon which the search was made.

The question yet remains, considering the acknowledged rapid disintegration of lead pipe now going on in many sections of this city and in other cities, where trolley lines have been operated; *what becomes of the lead if it does not go off with the water*, and it seemed best to draw some attention to the matter in this way that others might pursue the subject further.

It might be added that in the great number of recent gout cases, where joints were plainly involved, exercise, diet, free water, and alkalies did not seem to yield any results whatever, while iodides, to a certain small extent, did. Removal from Philadelphia also in a number of cases was of marked benefit, though in other cases it is but fair to say it was not. The presence of the blue line in the gums also in these cases would not be expected, and it is generally conceded that gout and the action of minute quantities of lead are practically undistinguishable, *i. e.*, plumbic gout looks exactly like other gout.

That the trouble with metal pipes from electrical action is real can be easily discovered, from the published experience of the Brooklyn Water Department and from our own difficulties, concerning which our department is as usual more reticent; but with us, frequent removals of pipe have been required in many sections, where new pipe of good quality has speedily crumbled and leaked, becoming a mere shell in a few weeks or months. The department has blamed the quality of the pipe, and to the workmen it has been a mystery. These facts are well known to plumbers also, hence the prevailing general change to iron pipe. While in Brooklyn, where numerous experiments have been made, they had not, up to a recent date, succeeded in finding any material capable of resisting both the water pressure and the electrical erosion.

REVIEW OF MEDICINE.

MEDICINE.

The Value of Chrysoidin in the Diagnosis of Cholera. (*Centralbl. f. Bakt., Parasit. u. Inf'kr.*, January 20, 1897.) By Walter Engles., M.D.

As Blachstein has stated that chrysoidin produces agglutination in cholera cultures in exactly the same manner as the diseased serum of immune animals, and does not produce agglutination in any other form of vibrio, and that it is therefore to be regarded as of equally diagnostic value as the serum of immune animals, the author, at the instigation of Pfeiffer, undertook to repeat the experiments in order to test their accuracy. He had at his disposal fifteen varieties of cholera vibrios and twenty varieties of other vibrios. In the earliest experiments it appeared that the various vibrios similar to cholera but not cholera, exhibited the agglutination most distinctly, in fact more intensely, and more quickly than the genuine cholera vibrio, and, moreover, that the older the culture, the more promptly the reaction occurred; therefore it was shown that the chrysoidin reaction was not specific for cholera. This became more evident when it was discovered that it was necessary to increase the quantity of chrysoidin in order to produce the reaction in the cases of virulent organisms. The slightest trace of calcium prevented the reaction, on the other hand, perhaps for this reason, water, impregnated with carbon dioxide, seemed to render it more distinct. The author reached the following conclusions: that chrysoidin agglutinates vibrios in a solution of the strength of one per cent.; that among these vibrios is included the vibrio of Asiatic cholera, although it is not the most sensitive; that the change in the reaction is quantitative rather than qualitative; that this agglutination is favored by prolonged growth of the micro-organisms upon artificial media; and that the degree of reaction does not bear any relation to the degree of similarity between the vibrio investigated and that of cholera. In regard to the claim that chrysoidin is the one substance that will produce this reaction, Engles states that he has obtained it with various organic acids and even some of the anilin dyes, such as malachit green and saffranin. In regard to the certainty of the reaction, it makes great difference which special make of chrysoidin is employed, two with which the author experimented being active, and one absolutely negative.

SAILER.

Application of the Fluoroscope to the Diagnosis of Diseases of the Thorax. (*Revue de la Tuberculose*, December, 1896.) By Professor Bouchard.

Normally the thorax of men shows, when viewed with the fluoro-

scope, the bones of the skeleton, and particularly, the shadow of the heart, which may be observed to pulsate. The region of the lungs should be clear, and the mediastinum hidden by the spinal column and sternum. If, however, pleurisy exists on one side, it casts a shadow, deepest at the base and growing lighter towards the apex, and moreover causes the displacement of the mediastinum towards the opposite side. If an old pleurisy with retraction exists, the mediastinum may be drawn toward the side diseased. Regarding the course of the disease, it is very easy by this method to watch the rapid absorption of the exudate, indicated by a clearing up of the upper portion. In case of pulmonary consolidation, due to tuberculosis, it is possible to recognize the region affected by the very deep shadow that it casts. If cavities are present they may also be easily perceived. It can nearly always be demonstrated that the area of dulness corresponds exactly with the area of shadow. Ordinarily, of course, in cases of pulmonary tuberculosis this shadow is found at the apex. Pulmonary consolidation may be further distinguished from pleurisy by the fact that it does not cause dislocation of the heart or mediastinum. In regard to other thoracic diseases, Bouchard has been able to recognize aneurism, enlargement of the aorta, mediastinal tumors, and even hypertrophy of the heart.

SAILER.

Contribution to the Knowledge of Leukemia. (*Deut. Archiv. f. klin. Med.*, November 5, 1896.) By Hector Van der Wey, M.D.

The author reports two cases in which he was able to make quantitative estimation of the nitrogen ingested and excreted for a considerable period of time. The first patient was a laborer of 23, with previously good history until a year before admission, when he became pale and thin. When first examined, the lymph glands were enlarged; the spleen extended into the right hypo-gastrium; there were 175,000 leucocytes per c. cm., bearing a relation of one to sixteen to the red cells, and the mononuclear type predominated. The daily quantity of urine varied between 1,000 and 1,400 c. cm., and showed an increase of urates and uric acid, but neither albumin nor sugar. In the subsequent history of the case, the liver became enlarged and the lymph glands more prominent; the erythrocytes diminished and the leucocytes increased, particularly the mononuclear forms; there were frequent epistaxis and variable fever. Death finally occurred as a result of increasing edema, and at the autopsy the characteristic lesions of leukemia were found. The first period of investigation lasted ten days. The amount of nitrogen in the food was 146.138 grammes; the amount of N. in the urine and feces was 165.689 grammes. The loss of N., therefore, equaled 19.501 grammes, with corresponding loss in the body weight of one kg. The next three periods were consecutive and lasted respectively eight, nine, and six days. During the first period the loss of N. was 5.088. During the second period it was 17.868 and during the third period, 18.246,

corresponding to the loss in body weight of 3.1 kg. The second patient was a girl, nineteen years of age, who one year previously had had an intermittent fever; since then she had grown somewhat weaker and had shown occasional attacks of fever. The erythrocytes were 3,100,000; the hemoglobin, 55 %; the leucocytes, 665,000, bearing a proportion to the red cells of 1 to 4.7. The chemical investigation was carried on for seven days; the amount of N. in the nutriment was 103.121; in the urine and feces, 101.191; showing a gain of 2.03 grammes of N. During this period the body weight was not altered. Further results of the chemical analysis showed that the greatest amount of uric acid was exuded during the acme of the fever, but that even during the periods of apyrexia it was greater than normal. In order to test the question whether the amount of uric acid corresponded to the number of leucocytes, which did not seem to be true in the two cases of leukemia that he reported; Wey carefully estimated the daily excretion of uric acid in a patient suffering from malignant lymphoma, with about 40,000 leucocytes. It appeared from this that at first the uric acid corresponded closely to the temperature, and that leucocytes were increased subsequently, that then the leucocytes decreased, and about 24 hours later there was also considerable decrease in the uric acid. Finally Wey discusses the question whether chronic and acute leukemia are totally different forms of disease. In the last case which he reported, the polynuclear cells were not greatly decreased at first, the patient's condition remaining stationary or showing slight improvement; subsequently, however, there was great increase in the mononuclear cells, until they reached 96.3 %, and the patient began to suffer from fever, edema, and hemorrhages, and the lymphatic glands throughout were considerably increased in size. He therefore concludes that this condition bears a close resemblance to the symptom complex of acute leukemia as described by Fränkel, and represents an acute exacerbation of the chronic process.

SAILER.

On Uric-Acid Excretion in Croupous Pneumonia. (*Zeitsch. f. klin. Med.*, Vol. XXXIII., Nos. 1 and 2.) By Dunin and St. Nowaczek.

Pneumonia offers the best field for the study of the relation between leucocytosis and uric acid excretion, since the leucocytosis must here be general, while in some experimental forms it may be local only, and because the sudden crisis, with absorption of the exudate and disappearance of the leucocytosis, would lead one to expect an increase in excretion of uric acid in the latter days of the fever, which increase should become most marked soon after the crisis, and sink to normal after five to seven days. All this, if Horbaczewski be correct in saying that the excretion of uric acid, arising from the body nuclein, is in direct proportion to the leucocytosis or to the destruction of leucocytes. The authors have examined systematically the uric acid secretion in five cases of croupous pneumonia (by Haycraft's method) and

found in all cases a moderate increase in the last few days before the crisis. After the crisis came a pronounced increase, sometimes to triple the amount excreted during the febrile stage. This "uric-acid crisis" continued two to four days, then excretion lessened, to reach the normal point after seven to eight days. This uric acid crisis had nothing to do with the urinary crisis (polyuria) and was often over entirely before the latter set in. These results are in accord with those of Ranke and Gerdes, and to a great extent with the more recent and extensive of Kühnau. That some of Kühnau's cases lend less complete support to Horbaczewski's views than do their own, the authors explain by the occurrence of complications during convalescence. Their own results could not have been due to change of diet, since the patients were put upon freer diet only after the highest point in excretion was reached.

EDSALL.

On the Supposed Presence of Lactic Acid in the Urine in Osteomalacia. (*Centralbl. f. innere. Med.*, No. 14, 1897.) By Hoffmann.

The view that osteomalacia is a simple chemical extraction of the bone-salts by a free acid was due originally to the work of C. Schmidt, who erroneously concluded from his experiments that he had found lactic acid in the cystic fluid in the bones. The expectation that the lactic acid would be excreted in the urine led to publications of its discovery based upon unsound chemical methods as shown by Nencki and Sieber, and Levy has shown that the decrease in calcium salts in the urine can not be due to extraction by acids, since the carbonates do not in reality suffer more than the phosphates. And numerous experiments have proved that the ingestion of lactic acid does not cause osteo-malacia, nor does the direct action of this acid upon living bones. Nevertheless, the view that lactic acid is present in the urine and that its early discovery may make a diagnosis possible in the beginning is so general that Hoffman took opportunity to investigate two cases in an advanced stage, and in which there could be no doubt of the diagnosis. Although fifteen litres of urine were examined from one case and over twenty litres from the second, he was unable to demonstrate any trace of lactic acid in either case, using a slight modification of the Salkowski method.

EDSALL.

The Internal Treatment of Kidney Calculi. (*Berl. klin. Woch.*, No. 14, 1897.) By Mendelsohn.

When one considers the insolubility of uric acid, the great dilution of any ingested medicaments by the body fluids, and the small surface a concrement presents, no medical treatment can seem reasonable but the preventive. The dietetic treatment is insufficient, and the restriction of meats in general is unreasoning, since only foods rich in nuclein increase uric acid production. The alkaline treatment is applicable to some cases, but not to all, since the acidity of the urine is not always increased, and there re-

mains always the danger of rendering the urine alkaline, and thus precipitating the phosphates. The lithia salts are too insoluble themselves to be of much value. Ebstein showed that the basis of formation of kidney calculi was an albumin-like substance upon which the salts were deposited, the process repeating itself in successive layers like the scales of an onion. Moritz and the author have further shown that this basic substance is not an evidence of disease, but is a component of normal urines, and only stagnation is necessary for the formation of calculi. In other words, it is a mechanical disease. Mendelsohn therefore recommends as the most rational treatment the use of alkalies when needed and with care as to the amount, always allowing free ingestion of liquids and producing free diuresis in order to occasionally flush out the upper urinary passages by sudden excretion of urine in large quantity, thus driving on any minute calculi that might cause future trouble. EDSALL.

On the Diagnosis of Duodenal Carcinoma. (*Archiv. f. Verdauungskrankheiten*, Vol. III., No. 1.) By Czygan.

Chronic stenoses of the intestine result in hypertrophy of the muscular layer above the narrow part, and subsequently in dilatation of that portion of the intestine. The stomach suffers from its inability to force on its contents and the resultant stagnation, and the occasional back-flow of intestinal contents. Stenoses of the large intestine cause, for the most part, intestinal symptoms, colic, etc., while stenoses of the duodenum show largely gastric symptoms, especially vomiting. The history will usually settle the question whether the process causing stenoses is within the intestinal tract itself or not. Czygan considers the condition of the HCl and ferments of the greatest importance in differential diagnosis between carcinoma of the pylorus and of the duodenum. In the latter he found in repeated instances the HCl abnormally high, though Herz has found the opposite. In a case here reported, which had symptoms and signs which might readily suggest pyloric carcinoma, he diagnosed its seat as the duodenum from the following points: The absence of leucin, tyrosin, and bile from stomach contents spoke for a location between the pylorus and ductus choledochus, and the continuous early presence of large quantities of HCl and active ferments spoke for the duodenum. Also, the ready elicitation of splashing between the tumor and liver, well to the right, spoke against its location at the pylorus, and was explained, post mortem, by the dilated first part of the duodenum communicating directly with the stomach through a dilated pylorus. [The first point would surely, from the relative frequency of the two, speak for the pylorus, and an early, generous supply of HCl and ferments, subsequently giving place to absence of free HCl, would suggest the same. The presence of large masses of sarcinæ at first, and their disappearance with the vanishing free HCl, is interesting in relation to Oppler's assertion of the great rarity of their occurrence in gastrectasia from malignant growth.] EDSALL.

Infectiousness of Dust in Colorado Springs. (*Transactions of the American Climatological Association*, 1897.)

Dr. Charles Fox Gardiner reports his experiments on the infectiousness of dust obtained from rooms occupied by tuberculous patients. In each case the dust from an area of a quarter to half a square yard was taken by means of cotton swabs from backs of pictures and dark corners, and was suspended in sterile water. It was then inoculated into the thigh of a guinea pig, two c.c. being used at each injection. As the largest hotel in Colorado Springs is more or less filled with invalids suffering from consumption, and as tourists and others in good health also frequently pass some time there in rooms that have been occupied, it was deemed of importance to determine, if possible, the infectiousness of dust from its rooms and halls. Eight guinea pigs, therefore, were inoculated with dust taken from the halls of the hotel and walls of the rooms occupied for several years. Of these eight guinea pigs none developed any tuberculous lesion, local or general. The pigs died respectively on the ninth and tenth day after inoculation and might possibly have developed tuberculosis; but, as all their organs and glands were perfectly healthy and showed no evidence after careful search for tuberculosis, it is doubtful. These guinea pigs were freshly imported from Ohio, and were inoculated within seven days of arrival in Colorado, allowing no time for them to become acclimated, and in this sense they represented travelers and tourists, and not natives.

HINSDALE.

SURGERY.

Clinical Contribution to the Surgery of the Liver. (*Annals of Surgery*, May, 1897.) By John O'Conor, M.D., B.Ch., of Buenos Ayres.

Dr. O'Conor reports a series of fourteen operations on the liver, including hepatotomy, trans-thoracic hepatotomy, coeliotomy, and abdominal section. The conditions for which the operations were required were abscess of liver, simple, suppurating, and collapsed, hydatid cysts, and hematoma. In the whole series the mortality was fourteen per cent. The author reviews briefly the report of each case, offering such criticism and comment as has been suggested by his actual experience with the cases reported. He calls attention to the unreliability of the exploring needle in finding small abscesses and recommends the use of the knife even though the needle fails to locate the abscess to which the symptoms point. He deprecates the "dangerous and useless procedure" of introducing sutures through parietes and cyst wall, before the cyst is partially emptied and the tension relieved, because escape of fluid into the peritoneal cavity will follow every puncture of the needle. He recommends the following method of opening cysts: Introduction of medium sized trochar, after walling off

peritoneal cavity with sponges; after tension is relieved, drawing the cyst wall to the surface with hooks and enlarging opening; suturing of the cyst wall to the parietes, the parietal peritoneum being ignored except at the upper and lower angle of the wound. O'Conor recommends in the operative treatment of hydatid cyst not only aspiration of the cyst but also contemporaneous removal of the endocyst, thereby diminishing to a marked degree subsequent suppuration. Bord's operation (that of sewing up and replacing the cyst wall) was practiced in one case, but with such poor results that in future cases the operator would discard this method in favor of marsupiliazation, though he does not consider this a "utopian procedure," because of the prolonged convalescence that necessarily follows. As a remedy for the latter, he suggests enlarging the parietal incisions, removing a large part of cyst wall, and suturing the remainder in folds to the external wound. One of the two fatal cases died from shock, following profuse hemorrhage from the liver substance. The operator divided a layer of healthy liver tissue, one inch thick, overlying the cyst, with first a blunt point bistoury, afterwards enlarging the opening with the sinus forceps. He confesses that in employing this method (which had been recommended by some as a safe procedure) he had made a fatal mistake, for the ensuing hemorrhage was so profuse as to cost the patient her life. If confronted with such a situation again, namely, a thick layer of liver tissue overlying the cyst, the operator would divide the operation into two stages, reserving for the second stage the division of the liver substance and the opening of the cyst wall. This stage should not be undertaken until adhesions have have formed at the parietal wound, thus forming a firm basis on which to make pressure. Pressure, he believes, is the safest means of effecting hemostasis. The danger of using the exploring needle in abscesses and hydatid cysts is emphasized; in the one case peritonitis, in the other rapid supervention of a sometimes fatal hydatid toxic poisoning, being the natural consequences of such a procedure. As a general rule, O'Conor advises that the needle be used only on the operating table, when, if fluid be found, it can be removed at once by the opening incision, thus eliminating the danger, as far as possible, of hydatid toxemia. The latter condition was observed in several of the reported cases. O'Conor has never been able to detect the so-called "hydatid fremitus" in the cases that have come under his observation.

C. H. Frazier.

Chemistry of Gall-stones, with Special Reference to their Mode of Origin. (*Medical News*, May 1, 1897.) By R. H. Chittenden, Ph.D.

The author divides gall-stones into three groups according to their chemical composition: *a*, those composed in great part of cholesterin; *b*, those whose chief constituent is bile pigment, combined with calcium; *c*, those composed mainly of calcium carbonate and phosphate. In man, calculi are composed chiefly of cholesterin, with pigment and calcium, or

the so-called "mixed cholesterin calculi." The nucleus is usually composed of an insoluble compound of bilirubin, with calcium salts. In studying the formation of gall-stones there are three factors to be considered, namely, cholesterin, bile pigment, and calcium salts, all of which are normal constituents of bile. Cholesterin is held in solution by sodium glycocholate and taurocholate and only when it reaches a point of concentration, exceeding one-tenth the weight of the bile salt, is it separated or crystallized. Bile in the gall bladder contains a larger percentage of cholesterin than does liver bile. This apparent concentration Hammersten attributes to a special activity of the epithelial cells of the gall bladder mucous membrane, which removes the water and soluble chloride constituents of the bile. Hence, retention of bile in the gall bladder, by increasing the concentration of the fluid, leads to a proportionate increase in the percentage of cholesterin. It is therefore easily understood that stagnation of bile in the gall bladder predisposes to the formation of biliary calculi. As to the origin of cholesterin, Chittenden disagrees with Naunyn, who attributes their origin solely to perverted metabolism in the epithelial cells lining the gall bladder. While this may be true of the cholesterin in gall-stones, Chittenden does not believe it to be true of the cholesterin in normal bile. He regards it purely as a genuine waste product excreted by all the cells of the body, the liver cells included, and eliminated unchanged, not only through the bile, but through the feces, skin, and milk as well. This perversion of metabolism is believed to be the result of a catarrhal process caused perhaps by the *Bacillus coli communis*, which has migrated from the intestinal tract. The origin of the nuclei of biliary calculi which is usually calcium bilirubin, an insoluble compound, is next considered. It is known that, though the bile pigments are held in solution by the alkali salt of the bile acids, they are precipitated in the presence of an excess of calcium salts. Several theories have been advanced to explain the cause of this excess of calcium salts, notably by Frerichs, Gamgee, and Jolles. Since it is known that the amount of calcium salts ingested in food bears no relation to the amount contained in bile, the explanation for this excess must be looked for elsewhere, and Chittenden sums it up as follows: the disposition of calcium bilirubin must be connected with pathological changes, as a result of which the normal calcium of the bile must be transferred into insoluble compounds, or else, as appears quite probable, there is an increased secretion of calcium from the epithelial cells of the mucous membrane, by which the formation of insoluble compounds is facilitated. Chittenden believes we have no positive proof that calculi can be removed by the action of a foreign solvent. A more plausible assumption is that agencies which tend to increase the flow of alkalinity of the bile would exert a solvent action. Calomel, corrosive sublimate, podophyllin, etc., ordinarily supposed to be cholagogues, have been shown by the experiments of Stadelmann and Pfaff to be of little or no value in stimulating

the secretion of bile. The therapeutic action of the salts of bile-acids, however, is to increase the secretion of bile, and is one which naturally suggests itself in the treatment of biliary calculi, where the bile ducts are not obstructed.

C. H. Frazier.

Lectures on Diseases of the Gall Bladder and Bile Ducts. (*British Medical Journal*, March 13, 20, and 27, 1897.) By A. W. Mayo Robson, F.R.C.S.

There is apparently no part of the biliary apparatus, except the liver, which may not be absent. The middle portion of the ductus communis choledochus and the upper two-thirds of the cystic duct are the only convenient situations for choledochotomy on account of the relation of branches of the hepatic artery and of the portal vein to the duct in the lesser omentum. The presence of two or three enlarged lymphatics in the smaller omentum may mislead the surgeon in palpating the common duct. A tongue-shaped prolongation of the right lobe of the liver may lead to difficulty in diagnosis and in treatment, because of its resemblance to a tumor of the liver or to an enlarged gall bladder. Acute catarrh of the gall bladder and of the bile ducts may be due to gastro-intestinal catarrh, exposure to cold, extension to the bile ducts of inflammation from the parenchyma of the liver, gall-stones, carcinoma of the liver, hydatids, pneumonia, and other infectious fevers. Icterus accompanying cancer of the liver is sometimes dependent upon associated catarrh, which may be relieved by treatment, though the original disease persists. Chronic cholangitis may be simply a sequel of the acute form and may then give rise to a more or less persistent jaundice leading to a suspicion of serious organic disease. Gall-stones are probably always accompanied by catarrh which, giving rise to the formation of a thick ropy mucus, leads to attacks of pain. It seems not unlikely that some of the minor seizures of pain not followed by jaundice are of this nature. Although the jaundice in cholelithiasis is usually produced by a gall-stone obstructing the common or the hepatic duct, in many cases jaundice is present when the concretion is in the gall bladder, or in the cystic duct, the obstruction to the flow of bile being caused by an inflammatory swelling of the mucous membrane of the bile channels. The treatment of chronic catarrhal jaundice is at first medical and, if the disease prove obstinate, the question of some organic cause requiring surgical interference may be considered. Catarrhal cholecystitis may be the sequel of gall-stone irritation; but it may also be due to the dependent position of the fundus of the gall bladder or to constant constipation and accumulation of feces in the hepatic flexure of the colon, interfering with the regular emptying of the gall bladder. The diagnosis of these cases is to be made from cholelithiasis by observing that the attacks are less severe and less prolonged than in true

gall-stone seizures, that no gall-stones are found in the evacuations after an attack, that jaundice seldom supervenes and, if it does, is only very slight, that there is no tenderness on pressure between the ninth costal cartilage and the umbilicus, and that the affection will usually yield to treatment. If, after medical treatment, the condition persists and operative interference is decided upon and at the operation no gall-stones are found, drainage should be established. After the third day it will be useful to gently syringe a little warm water through the drainage tube daily so as to wash out the ducts. After a fortnight or more the tube may be left out and the wound allowed to close. Suppurative inflammation of the bile passages and their relation to micro-organisms: Normal bile is sterile. Bile, in cases of disease of the gall bladder or bile ducts, always contains micro-organisms. When the flow of bile along the ducts is arrested micro-organisms, either from the blood or from the intestine, often invade the gall bladder. Streptococci, colon bacilli, and typhoid bacilli have been found in cases of empyema of the gall bladder. Simple empyema of the gall bladder is, as a rule, associated with gall-stones, but tumors of the bile ducts, typhoid and other fevers, and unexplained conditions may be predisposing factors. Infection by pyogenic organisms is probably in every case the true exciting cause. In this condition the symptoms will usually depend upon the cause. At first, constitutional symptoms may be only slightly marked, but after a while these develop. As a rule there is no jaundice. Tenderness is nearly always present on account of the local adhesive peritonitis, which is rarely absent. The tumor is at first circumscribed, rounded, movable with respiration, and later may become more diffused and general. The pus may evacuate itself at a distance from the point of its origin. Simple empyema should be treated by opening and drainage. The gall bladder should be aspirated before being opened in order to avoid soiling the tissue with pus. Acute phlegmonous cholecystitis and gangrene of the gall bladder is usually associated with gall-stones, although it may arise independently. Typhoid and typhus fevers, cholera, malaria, sepsis after operation, puerperal fever, and other unknown conditions may give rise to it. The disease usually manifests itself suddenly with pain, tenderness on pressure, and other symptoms of acute peritonitis, which is at first localized to the right side of the abdomen and which rapidly becomes general. Jaundice may or may not be present and fever is inconstant. The diagnosis is to be made from acute appendicitis. In the latter affection the pain begins at a lower point in the abdomen and travels towards the umbilicus; whereas, in the former, the pain begins beneath the ribs and passes to the epigastrium and behind the right scapula. The tender spot is at McBurney's point in the latter, and just above and to the right of the umbilicus in the former disease. As soon as the diagnosis is made, operation should be resorted to and the gall bladder incised and drained. If gangrene be present the gall bladder should be removed. Gangrene of the gall bladder may be due to three factors:

thrombosis of the nutrient vessels, bacterial infection, and absence of drainage with tension. Infective or suppurative cholangitis is, in the majority of cases, due to cholelithiasis; hydatid disease, malignant disease, and typhoid fever are also predisposing factors in favor of this disease. The exciting cause is invariably the presence of pyogenic organisms. There is progressive uniform enlargement of the whole liver, the organ being smooth and tender on pressure. If the cause be in the common duct and the gall bladder has not previously become contracted there will be additional enlargement caused by its distension. Pain may be entirely absent, jaundice is always present, continued fever with occasional rigors and profuse perspiration and progressive loss of flesh and strength are seen. Unless evacuation and drainage of the infected contents of the bile passages can be accomplished, treatment is practically useless. Ulcers of the gall bladder or bile ducts vary greatly in number, size, and depth, and in clinical importance. These lesions are important on account of the serious sequelæ, such as stricture, perforation, fistula, peritonitis, hemorrhage, septicemia, and pyemia. Hemorrhage may produce either hematemesis or black-colored stools. Stricture is rare and is produced by malignant disease or by cholelithiasis. If in the cystic duct, stricture will lead to a gradual enlargement of the gall bladder with or without pain. If in the common duct, jaundice and enlargement of the liver will be noted. The gall bladder may or may not be enlarged. A stricture of the gall bladder may convert that organ into an hourglass-shaped sac. In stricture of the cystic duct the gall bladder should be removed, or it may be short-circuited into the intestine. In case of stricture of the common duct, cholecystenterostomy must be performed. In perforation of the gall bladder or bile duct if the extravasated bile is diseased early operation should be insisted upon. The risk of perforation of the gall bladder is great when that sac is distended. The gall bladder may rupture into any of the adjacent organs.

SWAN.

Fistulæ are divided by Robson into those resulting from operation and those from disease (gall-stones or cancer). Biliary cutaneous fistulæ, according to the latest statistics, are the most common form. They may be either pathological, in which case they point at the umbilicus, or post-operative. The latter are either mucous or biliary. Mucous fistulæ follow usually a cholecystotomy, they discharge only about an ounce of fluid daily and cause but little inconvenience to the patient. On the other hand, biliary (post-operative) fistulæ discharge large quantities of bile daily and so annoy the patient that they usually seek relief in operations. If the fistulæ are small, the application of the actual cautery is advised. This failing, the abdomen may be opened, the gall bladder detached, and the opening sutured, or the fistula may be dissected from its cutaneous margin, the orifice of the fistula being then closed accurately with sutures. Biliary

intestinal fistulæ are most commonly due to ulceration produced by gall-stones. The symptoms of this condition vary in their constancy; we may have pain over the liver, jaundice, fever of an irregular type, and lastly, signs of more or less complete obstruction. Intestinal obstruction from gall-stones is thought by Robson to be a distinct complication of cholelithiasis. He describes four varieties: 1. Due to local peritonitis, leading to paralysis of the bowel. The symptoms of this variety may be severe enough to simulate strangulation or intussusception, but the diagnosis is usually not difficult. These cases usually yield to general and medical treatment. 2. Volvulus of small intestine, dependent upon the violence of the colic caused by an attack of gall-stones. This variety is fortunately rare, as a positive diagnosis is out of the question until the abdomen is opened. As the obstruction is mechanical, operation is clearly indicated and offers the only chance of recovery. 3. This is the most important variety, not only on account of this frequency, but also high mortality (50 %, Kermisson and Rochard). It is dependent upon the mechanical obstruction and damage to the bowel produced by passage of large concretions through the intestine. The site of obstruction is, in the majority of cases, in the ileum. This condition occurs most frequently in women between the ages of 40 and 60 years. It is curious to note that obstruction may be caused by quite small stones (55 gr.), while large ones (circumference $3\frac{3}{4}''$) may pass comparatively easily. The symptoms are those of acute intestinal obstruction, but the age, sex, previous history, early fecal vomiting, and visible peristalsis, are points to be borne in mind in making a diagnosis. The treatment should be first medical and expectant, not waiting beyond the period when operation may be undertaken with every hope of success. As regards the time for operation, Robson's method is as follows: If the case is seen in the earlier stage, morphine, belladonna, siphon enemata, and stopping of all food by the mouth are indicated. This failing to afford relief, chloroform anesthesia is advised, serving as it does two purposes: first, it allows of thorough examination of abdomen; secondly, the manipulation may reduce hernia or volvulus, or dislodge a calculus. The last resort, but one which offers every prospect of success, if attempted in a comparatively early stage, is to operate. Tumors of the gall bladder are classified next as follows: 1. Those caused by distension of bile, concretions, pus (empyema), or mucus (hydrops), and (2) those caused by new growths, benign and malignant. Those tumors due to distension of the gall bladder by concretion or bile are very rare, while those of the other varieties occur more frequently. The diagnosis must be made from a movable right kidney, tumor of the kidney to supra-renal capsule, fecal impacta, pyloric tumor, and tumors of the liver. Innocent growths of the gall bladder are rare, as are also the malignant, when primary. The malignant tumors include the columnar-celled carcinoma, the spheroidal-celled carcinoma, sarcoma, and squamous epithelium. Secondary malignant tumors are asso-

ciated most frequently with gall-stones (Zinkert gives 85%) and are usually diagnosed by their rapid progressive growth and their characteristic hardness. The treatment is usually purely palliative. Tumors of the bile ducts are classified similarly to those of the gall bladder.

C. H. Frazier.

The diagnosis of tumors of the gall bladder from impacted gall-stones is practically impossible. Surgical treatment of gall-stones, cholecystotomy, is the operation to be aimed at in the treatment of cholelithiasis. It is often impossible to say what operation will have to be done until the abdomen is opened. The indications for operation are: 1. Infrequently recurring biliary colic without jaundice and with or without enlargement of the gall bladder. 2. In enlargement of the gall bladder without jaundice, even if unaccompanied by great pain. 3. In persistent jaundice ushered in by pain and where recurrent pains with or without ague-like paroxysms render it possible that the cause is gall-stones in the common duct. 4. In empyema of the gall bladder. 5. In peritonitis starting in the right hypochondrium. 6. In abscess around the gall bladder or bile ducts, whether in the liver, under the liver, or over the liver. 7. In some cases when, although gall-stones may have passed, adhesions remain and prove a source of pain and illness. 8. In mucous, mucopurulent, or biliary fistula. 9. In certain cases of chronic jaundice, with distended gall bladder dependent on some obstruction in the common duct, although the suspicion of malignancy be entertained. In such cases the increased risk must be borne in mind, as malignant disease may be the cause of the obstruction, and operation in such cases is attended with greater danger than ordinary. 10. In phlegmonous cholecystitis and in gangrene, if the case has been seen and recognized at a sufficiently early stage of the disease. 11. In gunshot injury or in stab wounds over the region of the gall bladder. 12. In suspected rupture of the gall bladder without external wound. 13. In some cases of chronic catarrh of the gall bladder or bile ducts. 14. In suppurative cholangitis. Sounding and aspiration of the gall bladder are both unsafe procedures and small exploratory incisions are preferable. Cholecystenterostomy consists in establishing an artificial opening between the gall bladder and intestine, preferably the duodenum. The indications for the operation are as follows: 1. In biliary fistulæ depending on stricture or other permanent occlusion of the common duct. 2. Very occasionally in cancer of the head of the pancreas or malignant tumor of the common duct leading to chronic jaundice and distended gall bladder; but in such cases the mortality will necessarily be so high that the justifiability of the operation is questionable. 3. Occasionally impaction of gall-stones in the ducts where the patient is not in a fit condition to bear the more prolonged operation of separating adhesions and crushing or removing the concretion by choledo-

chotomy. 4. In certain cases of obstruction of the cystic duct where choledochotomy is impracticable. The operation is contra-indicated: 1. In any obstruction of the bile ducts which can be cleared away with reasonable probability of success. 2. In malignant disease of the head, of the pancreas, or of the common bile duct leading to distension of the gall bladder, the mortality is so great (eight operations with seven deaths) that it is hardly worth doing. 3. In contracted gall bladder where it is impracticable to insert the button. 4. Where there are extensive adhesions which would lead to kinking of the bowel. 5. In very large gall bladders with obstructions of the cystic duct; in which case cholecystectomy should be done. The operation may be performed by means of simple suture, by decalcified bone button, or by Murphy's button.

SWAN.

NEUROLOGY.

A Contribution to the Clinical History of Non-Suppurative, Acute (Hemorrhagic) Encephalitis, with the Report of a Case Following an Attack of Mumps. (*The Journal of Nervous and Mental Disease*, January, 1897.) By James J. Putnam, M.D.

The author gives an excellent brief review of the literature on acute encephalitis, and reports the following case observed by himself: A boy, previously healthy, had had an attack of mumps, and for ten days before the present illness began had apparently been entirely well. The first distinct signs of a cerebral disease were partial bilateral ptosis, especially noticeable on the right side, and impairment of the motion of the right eye, which is said to have turned inward. The boy became deaf and complained of frontal pain. Dulness and drowsiness were very marked, and occasionally the patient was delirious. A sensation of numbness and weakness was felt in the left arm and leg, although there was no paralysis of the limbs. The temperature ranged from 99° to 100°; the pulse from 70 to 90. The condition of the child gradually became worse, both eyes were motionless and fixed in the median line, and the power of swallowing was impaired. Paresis of the lower facial muscles and double optic neuritis of moderate intensity were noticed. The knee-jerks and wrist-jerks were absent on both sides, but the plantar and abdominal reflexes were present. The sensibility of the skin seemed to be lessened on the left side of the trunk and in the left extremities more than in the right. Improvement in the case was very decided after a few months.

SPILLER.

A Contribution to the Study of Unilateral, Isolated (Congenital?), Facial Atrophy. (*Neurologisches Centralblatt*, Number 7, 1897.) By Prof. M. Bernhardt, of Berlin.

The existence of unilateral, isolated, congenital, facial paralysis has

never been positively demonstrated. Bernhardt reports a case in which the unilateral facial paralysis was noticed soon after birth, and which is similar to another case published by him three years previously. He showed at that time that in the reported cases of congenital facial paralysis, either isolated or associated with ocular palsies, the muscles of the lips and chin were less affected than the other muscles innervated by the seventh nerve. In facial paralysis of undoubtedly peripheral origin this unequal involvement of the muscles has been observed, as it has also in the cases of congenital or early acquired bilateral facial palsy with ocular paralysis. This latter form cannot be so easily ascribed to a peripheral origin. No necropsies been have obtained in these so-called congenital cases of unilateral facial paralysis, and only one made within the first few days or weeks of extra-uterine life would be of service in deciding the question of the primary nuclear or neural origin of these palsies. The experiments of Gudden have shown that in the young the cells atrophy after destruction of their axis cylinders. In the case reported by Schultze, and in the two by Bernhardt, the labor was normal.

SPILLER.

A case of Paralysis of the Fifth Nerve. (*The Edinburgh Medical Journal*, January, 1897.) By W. R. Gowers, M.D., of London.

Gowers reports a case of almost isolated paralysis of the fifth nerve. No history of syphilis could be obtained. The patient, a woman, had been under his observation for sixteen years. She had had an attack of diplopia, giddiness, and loss of sensation in the parts near the right temple two years before Gowers had seen her. Later she had had two similar attacks. Three months after the last attack she awaked one night with a burning sensation in the right side of the face, and to a less degree in the ear, and noticed that she had lost objective sensation in these portions. When the patient was first seen there was no paralysis of any ocular or facial muscles, but objective sensation was absolutely lost in all parts supplied by the right fifth nerve, and the muscles of mastication on the same side were affected. Taste was absolutely lost upon all parts of the right side of the tongue, front and back, and on the palatine arch. On the corresponding parts of the left side no impairment whatever was perceptible. Gowers believes that the taste fibres from all parts reach the brain through the fifth nerve, partly by means of the tympanic branch to the fifth. About a year after the beginning of the trouble the right external rectus was found to be paralyzed, and there was complete loss of smell on the right side. At present there is some restoration of taste-sense on the back of the tongue, and the external rectus is paralyzed, without the involvement of any other ocular muscle. Gowers believes the fifth nerve in this case is diseased at its origin, because there has been no trophic disturbance of the eyeball, such as is common in acute lesions in front of the Gasserian gang-

lion. The patient suffered from no severe headache, no optic neuritis, and there was nothing to suggest the presence of a growth. Possibly syphilis or some local inflammation may have been the cause. The patient at present has slight weakness of the muscles of the right side of the face, slight alteration in the electric irritability of the facial muscles and of the right side of the tongue, and slight deafness from middle ear disease. Loss of smell in injury of the fifth nerve is due to changes in the mucous membrane of the nose. The fifth nerve also supplies the middle ear, and the changes here are comparable with those in the nasal mucous membrane in lesions of this nerve. The slight diminution of power and of electric excitability of the muscles of the face and right side of the tongue may be explained, possibly, by the fact that the fifth is the afferent nerve from these parts, and on it depends the nutrition of the fibrous tissue of that portion through which the motor fibres pass to their endings on the sheaths of the muscular fibres.

SPILLER.

Concerning Pseudospastic Paresis with Tremor Following Trauma. (*Neurologisches Centralblatt*, No. 8, 1897.) By B. Onuf (Onufrowicz), M.D., of New York.

Onuf reports the following case: A man of forty years, who drinks and is a frequent smoker, received a blow upon the head which caused no visible wound, though it may have produced cerebral concussion. The patient was completely paralyzed and speechless for twenty minutes. After this period speech and the power of motion partially returned, but the arms were completely paralyzed and without sensation, and the man was unable to walk, although he could move the legs in bed. After six days the motor paralysis of the arms had almost entirely disappeared, and the patient could walk without assistance. The motor power was about the same as before the accident. On examination the patient presented a tremor of the tongue and hands, which was probably due to alcoholism, but in addition to this there was a tremor in all the limbs, more noticeable in the lower, which resembled the tremor when the body is exposed to cold (shivering). This tremor was scarcely noticed when the man was at rest. The gait was markedly spastic. The deep reflexes were much exaggerated, but the skin reflexes were lessened. Disturbance of objective sensation was not observed, though the patient complained of paresthesia. The reaction of the pupils was not prompt, and the senses of smell and hearing were less acute. In many respects this case resembled those described by Nonne and Fürstner, but the exaggeration of the reflexes has not been noticed in all the cases. The impairment of the skin reflexes was a peculiar feature and may have been due to alcoholism. Onuf regards his case also as a neurosis, though he was not able to find hysterical stigmata.

SPILLER.

A Contribution to the Pathology of the Bulbospinal, Spastic, Atrophic Paralyses. (*Neurologisches Centralblatt*, No. 6, 1897.) By A. Hoche, of Strassburg.

Hoche reports a case of amyotrophic lateral sclerosis. The method of Marchi showed marked evidences of degeneration in the pyramidal tracts from the cerebral peduncles to the Rolandic cortex. The degeneration of these tracts in the cord, oblongata, and pons, had been of too long duration for the employment of this method. It was, therefore, clearly established that the process had been an ascending one. The ganglion cells were relatively slightly altered, but the short fibres which unite different levels of motor nuclei, *i. e.*, the posterior longitudinal fasciculi and fibres of the anterolateral columns, were much degenerated. Degeneration was found in nerves which clinically had not appeared to be affected, as in those of the eye muscles, and in the facialis, hypoglossus, and accessorius the changes were more intense than were expected from the symptoms. The alteration in the posterior longitudinal fasciculi may be explained by Brissaud's theory that amyotrophic lateral sclerosis is a "systemic disease of the short fibres of the entire cerebro-spinal axis." It is hardly to be doubted that the posterior longitudinal fasciculi unite the nuclei of the motor cranial nerves, as the short fibres of the anterolateral columns unite the cells of the different regions of the spinal gray matter. These posterior bundles have been found degenerated in cases of amyotrophic lateral sclerosis by Muratoff, Mott, and possibly others. The findings in this disease may be said to be: 1. Degeneration of the entire pyramidal tracts. 2. Degeneration of the peripheral motor neurons from their cells of origin to their terminations in the muscles. 3. Degeneration of commisural cells and fibres in the cerebral cortex, posterior longitudinal fasciculi, and anterolateral columns of the cord. The disease is the result of degeneration of the cells and fibres in both motor segments, and of the cells and fibres which unite motor nuclei of different levels.

SPILLER.

Paroxysmal Paralysis of Epileptic Nature. (*Neurologisches Centralblatt*, No. 4, 1897.) By H. Higier, of Warsaw.

Higier states that the distinction between partial (Jacksonian) and true epilepsy is not a sharp one. The partial may end in general convulsions, with loss of consciousness; on the other hand, chronic convulsions in true epilepsy may occasionally be limited to a certain part of the body, and not be with unconsciousness. In Jacksonian epilepsy with a sensory aura, due to syphilitic disease, consciousness has been found to be much affected, even when the convulsions were confined to one limb. The aura may be the same in either form. The partial epilepsy is often the initial symptom of an organic cerebral affection, but the true epilepsy may also occur as such. Involuntary passage of urine and status epilepticus may

be found in either form. The sensory equivalents of epilepsy are well known. They consist of transient disturbances of sensation, which may be limited to some one part. The paralytic form of Jacksonian epilepsy is uncommon. Higier reports the case of a boy of six years, who had an attack of epileptic convulsions with loss of consciousness. A week and a-half after this he began to have momentary attacks, almost daily, of paresthesia with paralysis in the right leg, lasting ten to fifteen seconds, without loss of consciousness. Sometimes the weakness extended to the trunk muscles and the upper limb of the same side, and the boy fell if he were standing. The weakness in the hand was never as great as in the leg. There was frequently a sensation of tickling preceding the paralysis. Higier regards the condition as a motor paralytic equivalent of Jacksonian epilepsy, and bases his opinion on the following facts: In essential epilepsy the patient sometimes falls unconsciously, and the muscles remain relaxed. A paralysis of brief duration is common after attacks of Jacksonian epilepsy. Occasionally in partial epilepsy one part of the body may become convulsed, while another on the same side may be paralyzed. Weakness may precede convulsions in Jacksonian epilepsy. In partial sensory epilepsy occasionally complete loss of function of one of the organs of special sense may be noticed (transitory deafness, blindness, or diminution of the visual fields) as an equivalent, and may be associated with motor paralysis, or aphasia. *Migraine ophthalmoplégique* is undoubtedly at times an epileptic equivalent, and motor paralysis (of the eye muscles) is prominent in this. Chorea is similar to epilepsy, and there is also a paralytic form of the former, chorea mollis s. paralytica. In Higier's patient the aura, the short duration and similarity of the attacks, the sudden falling, the occasional attacks during sleep, the monoplegic or hemiplegic type, the successive involvement of the affected parts, the convulsions in infancy, the two or three typical epileptic attacks, and the good effect of bromide, are indications of the cerebral nature of the affection. Higier is inclined to think there may have been a small tumor in the leg centre, possibly tubercular, as there were certain suggestive symptoms of tuberculosis. He is able to refer to very few cases similar to his.

SPILLER.

A Contribution to the Study of Bernhardt's Disturbance of Sensation in the Thigh. (*Neurologisches Centralblatt*, No. 6, 1897.) By Georg Köster, of Halle a. S.

In 1895, Bernhardt directed attention to the disturbance of sensation in the area of the external cutaneous nerve of the thigh. Köster reports a well-observed case in the person of a physician. The trouble only appeared after prolonged standing, especially after visiting museums, and consisted of a burning, painful sensation with a feeling as if the thigh were bandaged and the muscles shortened. There were three attacks with re-

covery from each after rest and massage, but after the third, disturbance of objective sensation was observed in the area of the external cutaneous nerve. In the last two attacks both thighs were affected. Walking was not interfered with. In the same number of the *Neurologisches Centralblatt* another case of this affection is reported by T. Benda.

SPILLER.

Four Cases of Cerebellar Disease (one Autopsy) with Reference to Cerebellar Hereditary Ataxia. (*Brain*, 1896.) By William G. Spiller, M.D., of Philadelphia.

The first case was remarkable for the position in which the patient moved about, always getting on his hands and knees when permitted to do so. There was some tendency to fall backwards and great swaying of the body when walking upright, but this incoördination was not increased by closure of the eyes. There was myoseismia of the eyeballs, causing a sort of pseudo-nystagmus. Knee-jerk was greatly exaggerated, and ankle-clonus present on both sides; sensation to pain or touch was everywhere normal. Vision was defective, it being impossible for the patient to distinguish color, although he could recognize form very well. His speech was peculiar, it being almost impossible to understand his method of pronouncing words unless thoroughly familiar with him, nevertheless, he talked freely and without repetition. His intelligence was of very low grade. The cause given by his parents for his condition was a fall at the age of nine months. He did not begin to walk until five years old. The first symptoms that attracted attention occurred when he was fifteen. Although there is no neuropathic history in the family, nevertheless, so many of his brothers and sisters died in infancy that it is justifiable to look upon the condition as congenital. The second case had scanning, explosive speech, exaggerated reflexes, great incoördination in all the limbs, and a gait of decidedly cerebellar type. Romberg's sign was absent and there was no paresis. The patient had a tendency to fall down, and always toward the left side, with an inclination forward or backward. There was no neuropathic family history. In the third case, convulsions began a year after birth, and were severe at four years of age. Sensation to pain was preserved; the pupils reacted to light, and probably to accommodation. There was instability of the eyeballs. The patient stood with the limbs far apart, and exhibited a constant tendency to fall. The movements in the limbs were extremely incoördinate; the knee-jerks greatly exaggerated, but there was no ankle-clonus. The author believes that these three cases represent some form of cerebellar disease, if not congenital, at least beginning in early infancy, and in all probability of a hypoplastic or sclerotic nature, or both. It is exceedingly probable that the cerebrum was also involved in the process, at least in two of the cases, on account of the very feeble intellectual qualities. The fourth case is the most interesting, on account of the

autopsy and careful report of the condition of the brain. The patient did not learn to walk until he was three years old; at five he had an attack of scarlatina and diphtheria, after which his speech and walk were both worse. His gait was peculiar, his steps being short, the trunk held stiffly, but bent slightly forwards, and his head turned slightly toward one side. Death finally occurred as a result of tuberculosis. In removing the brain the gross changes first observed were the great deficiency in the corpus callosum, the small size of the cerebellum, and the atrophy of the left cerebral hemisphere. The greatest breadth of the cerebellum was $1\frac{11}{16}$ inches. There was sclerosis in each hemisphere and in the vermis. The left posterior corpus quadrigeminum was smaller than the right; the cord was slightly below normal; the cerebral peduncles were small. The sclerotic area in each cerebellar hemisphere occupied the external portion, and was more extensive on the left side. The different layers were equally affected. In these areas coarse fibres were almost entirely absent; no cells of Purkinje could be seen. The vessels were slightly more numerous than normal. The only part of the dentatum involved in the sclerotic process was the posterior portion on the left side. The left optic thalamus was smaller than the right, and this difference was apparently much greater than the difference between the two anterior cerebellar peduncles. Both lower olivary bodies were extremely atrophied, but the posterior accessory olives were in nearly normal condition. The arcuate nuclei were entirely absent and there were no external arcuate fibres. The sixth centres and the fibres connecting them with the superior olives appeared to be normal, although the patient had had internal strabismus. There was no sign of atrophy in either one of the sixth nuclei, or in the nerves proceeding from them. On account of the intense atrophy of both lower olives, the central tegmental tracts were examined carefully. At the level of the entrance of the eighth nerves there was a zone on either side, less deeply stained, between the superior olive and the fillet. At higher levels it was impossible to trace these atrophied fibres. The lenticular nucleus on each side was slightly smaller than normal, but the ansa lenticularis was not atrophic. The middle cerebral peduncles were degenerated; the nuclei pontis were almost entirely absent. The restiform bodies were small, especially where they were embraced by the two roots of the acoustic nerves. The pyramidal tracts were normal. There were no marked changes in the spinal cord, except in the middle thoracic region, where there was distension of the vessels and hemorrhage into the substance of the gray matter. Examination of the cerebral hemispheres disclosed nothing remarkable. As, however, the cerebral, as well as the other parts of the nervous system, were considerably below the normal size, the author believes that the theory of hypoplasia of its tissue best accords with the results of the examination of the specimens. The disease, of course, is the hereditary cerebellar ataxia of Marie. In conclusion, the author calls attention to the fre-

quency with which one meets with a history of infectious disease preceding these cerebellar conditions, although he is not inclined to regard such an infection as more than an *agent provocateur*.

SAILER.

Habit Chorea. (*American Journal of the Medical Sciences*, May, 1897.) By Wharton Sinkler, M.D.

The author's conclusions as to treatment of this affection are that the majority of cases depend upon some distinct and positive cause, which careful investigation will usually discover. It is essential, therefore, in every case to determine the existence of a cause, and to take measures for its removal. In cases of long standing, however, it is not sufficient merely to get rid of the cause, for the nerve-centres having acquired a vicious habit do not recover their normal condition until systematic treatment has been pursued. This is especially observable in those cases in which habit-chorea has resulted from an error of refraction. The experience of de Schweinitz and Thomson at the Infirmary for Nervous Diseases, Philadelphia, coincides with the author's in this respect. It has been found that medical treatment alone seldom arrests the choreic movements. On the other hand, mere correction of the refraction does not cure them. It is necessary, therefore, first to correct the ocular defect, either by glasses or tenotomy, and then to pursue a course of medicinal treatment. The same statement applies to those cases in which nasal or throat disease has been the cause of the affection. In nearly all cases the general health is at fault. The patient is anemic, or he is run down from overstudy, improper food, or some attack of illness. The point of first importance, then, is to look carefully after the general health. Tonics, more especially chalybeates, should be administered, and, if possible, change of air is to be obtained. In school children it is usually necessary to stop study for a time. The one drug which seems to exert a special influence upon the disease is arsenic, and it should be administered in the same manner as in the treatment of chorea minor. It is seldom of value when given in small doses, but it should be administered in gradually ascending doses until some toxic influence is observed.

HINSDALE.

OBSTETRICS AND GYNECOLOGY.

Hygienic Feeding of Infants. (*L'Obstétrique*, January, 1897.) By Al. Boissard, M.D.

In order to obtain statistics in regard to the relative values of the different methods of feeding, the infants at the Ledru-Rollin Asylum were divided into five classes: 1. Those fed upon mother's milk exclusively. 2. Those placed upon mixed diet—mother's milk and sterilized milk. 3.

Those placed upon mother's milk and "humanized" cow's milk. 4. Those placed upon sterilized and "humanized" cow's milk. 5. Those fed exclusively on humanized milk. Unfortunately it is not always possible for the infant to be nursed by the mother, as it should be for the first five or six months, and artificial means of some kind must be employed. Supplementing the deficient amount of mother's milk with sterilized or Pasteurized cow's milk gives excellent results, except in a few cases where the excessive amount of casein in the latter renders it indigestible. In such cases the substitution of "humanized" or "modified" milk cured the gastro-enteritis and the infant gained rapidly in weight. When it was necessary to resort to artificial feeding entirely, the modified milk gave much better results than the sterilized. Two charts are given showing a gradual loss of weight in the infants while sterilized milk was used, but an increase as soon as modified milk was given. Charts are shown of infants fed upon modified milk exclusively for periods varying from fourteen days to four months without the slightest gastro-intestinal disturbance. The only arrests or loss in weights occurred when, owing to a failure in the supply of modified milk, boiled or sterilized milk was used. "These facts seemed too interesting not to be reported, and, without wishing to draw too definite conclusions, I may say that they confirm my opinions expressed one year ago, namely, that modified" (maternalized, humanized) "milk does excellent service in the feeding of infants in those selected cases in which it has been substituted for sterilized milk, and that its exclusive and prolonged use has given most happy results." The twenty-three weight charts serve to illustrate the article excellently. [The modified milk referred to is prepared by centrifugating the cow's milk and then combining the various constituents in the proportions in which they occur in human milk. Such milk is prepared by several laboratories in Boston, New York, Philadelphia, and Chicago.] L. S. Smith.

I. A Contribution to the Technique of Division of the external Os. (*Centralblatt für Gynäkologie*, February 27, 1897.) By A. Rosner, M.D.

II. In Regard to Dilatation of the external Os after the Method of Rosner. (*Centrlb. f. Gynäk.*, February 27, 1897.) By Prof. A. von Mars, M.D.

I. Rosner has devised the following plastic operation on the cervix in order to prevent recurrence of the stenosis after division of the external os cervicis. It consists of the preparation of flaps from the vaginal aspect of the cervix and implantation of them in the angles of the wound made by the division. In this way union of the sides of the angle of the wound is prevented, and the rest of the cut surfaces are held apart until cicatrization has occurred. II. The method of Mars is practically the same as that of Rosner, except that it has the advantage of avoiding the two additional wounds caused by the preparation of the flaps. The flaps are begun at the

external os and dissected up outwardly to the sides of the vaginal cervix, their basis being as far from the os as it is proposed to carry the incision to divide the stenosis. After the flaps have been prepared the cervix is incised on either side as far as the bases of the flaps, which latter are then sutured into the angles of the cervical wound.

L. S. SMITH.

Two Cases of Ovarian Hernia. (*Centrlb. f. Gynäk.*, March 6, 1897.) By R. Biermer, M.D.

After enumerating the various forms of ovarian hernias that have been reported and reviewing briefly the literature on the subject, the author reports two cases that he had an opportunity of seeing as assistant in the University Frauenklinic in Bonn. Case I. A IVpara, aged 37, married seventeen years, acquired an inguinal hernia two years after marriage. For two years it gave her little trouble, then she was advised to wear a truss, which she did for two years. She had no further trouble for six years, when a swelling the size of a walnut appeared in the right inguinal region. This grew larger gradually, causing, however, no distress except at her periods, when it became swollen hard and painful. The tumor proved to be a right inguinal ovarian hernia. The ovary on that side, twice its normal size, was removed, the sac dissected out and cut off, and the inguinal opening closed. A microscopical examination confirmed the diagnosis. Case II. A nullipara, aged 26, had noticed a small painful swelling in right inguinal region. With the beginning of each period and for two or three days after it the whole region of the inguinal canal became tender. A careful examination under chloroform failed to discover the right ovary until after a successful attempt to reduce the hernia, then it was just felt within the internal abdominal ring. The patient was advised to have an operation performed if a carefully adjusted truss did not relieve her distress. The majority of inguinal hernias are congenital, all other forms of ovarian hernias are acquired. Out of 78 cases of the inguinal variety of which the etiology was given, 54 were congenital, and of these 54, 28 were bilateral. Where there are accompanying malformations of other parts of the genital tract the hernia results from a defective sexual differentiation in early fetal life. In acquired hernia the predisposition to the formation of a sac must be supplemented by a disposition on the part of the ovary. This disposition may be due to excessive length of the ovarian ligament, to deviation of the uterus, or to a too great inclination of the pelvis. Symptoms may fail altogether, or the pain may be so great as to be unbearable. On careful examination, the hernial contents, the percussion, the distress at the periods, the failure of any symptoms of incarceration, and the systematic bimanual examination should make the diagnosis sure.

L. S. SMITH.

PEDIATRICS.

Epidemic of Infantile Paralysis. (Reported by the Chemical Society of London. *Lancet*, April 3, 1897.) By Dr. Pasteur, of Paris.

The author reports an epidemic in which seven children belonging to the same family were attacked in the space of three weeks with moderate fever accompanied by severe headache. In three of the children, aged eleven, nine, and five years respectively, paralytic symptoms occurred in the first week of the illness. The type of the paralysis varied in each case. In one there was flaccid paralysis of the left arm, in the second right hemiplegia and persistent muscular rigidity of the right leg with more transient paralysis of the face and soft palate on the same side, in the third case the paralysis and rigidity were limited to the left leg. In two of the other cases the early fever was followed by tremors lasting a few days, while in the remainder there were no nervous manifestations. Diphtheria, influenza, and the exanthemata were excluded as causative factors. These cases confirm the opinion that infantile paralysis is an acute infectious disease. Dr. Buzzard, discussing these cases, suggested that the rigidity might be attributable to the influence of the poison upon the lateral columns. He also referred to a little boy, the subject of infantile paralysis, whose sister had been taken ill a few days previous to his attack with symptoms like those imitating his illness. She recovered without paralysis. S. M. Hamill.

Researches on the Pathogenesis of Rachitis. (*Revue mensuelle des maladies de l'enfance*, March, 1897.) By Smaniotto Ettore, M.D.

After reviewing the more important work done in this line, the author gives the results of his own experiments. Ettore repeated the work done by Mircali, who found from cultures made from the pulp of rachitic bones *Staphylococci* and *Streptococci pyogenes*, and concluded therefrom that rachitis was an infectious staphylo-streptococcic osteitis. Ettore made bacteriological examinations of the epiphyses of rachitic and non-rachitic bones during the months of December, January, February, and March, beside one case in September and one in October. He also studied during May, June, and September, twelve cases of non-rachitic bones. *Technique.* He cauterized a large surface of the anterior extremity of a rib and penetrated the interior of the cartilaginous tissue with a sterilized pipette and aspirated. He made cultures on gelatine plates and large agar tubes. In most cases, by the same procedure, he cultivated the marrow of the diaphysis of the same bone. He endeavored always to have the same quantity of substance. He selected ribs and clavicles because they were more readily obtained. In the rachitic cases he chose bones in which the lesions were evident to the eyes. In the sound bones examined there was no trace of rachitis. He made twenty-five examinations in the bones of non-rachitic children. In sixteen of these the inoculations remained sterile,

six cases gave pure cultures of streptococci, two gave the *Bacterium coli communis*, and one case gave few colonies of *Staphylococcus pyogenes albus*. In the six cases showing streptococci, four were from children dead of diphtheritic angina associated with the streptococcus, the fifth was in a child dead from a cystic scarlatina, and the sixth from a fatal case of broncho-pneumonia; in the last case the colonies were few. The author believed that a streptococcemia, in which one of the localizations had been the bones, especially the epiphyses, had existed during life. There were no other appreciable lesions of the bones. The two cases in which he found the *Bacterium coli communis* had died of very grave measles complicated by broncho-pneumonia and acute enteritis, and from this he infers that the bacilli were present as the result of an infection by this organism during life and were not the result of invasion after death. He concludes from these observations that in septic conditions in children the microbes readily invade the bones, that they are found in the long bones and especially in the epiphyses, and that in a child the *Bacterium coli communis* and other bacteria inhabiting the intestine very rarely, if ever, invade the bones in the first 30 or 35 hours after death.

S. M. Hamill.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

LIABILITY OF PHYSICIAN WHOSE WRONGFUL DIAGNOSIS CAUSES BREACH OF MARRIAGE ENGAGEMENT.

A physician is liable in damages for his failure to exercise the requisite care in examining one person at the instance of another to whose daughter the former was engaged, where the purpose of such examination was to determine whether he was afflicted with a venereal disease, and where, in consequence of such mistaken diagnosis, the engagement of marriage was broken.[1] The evidence produced at the trial tended to show that the plaintiff, a jeweler and repairer of watches, and engaged to be married to the daughter of the defendant M., received, while at work, an accidental injury which required the attention of a physician and the application of remedies to his private parts. The defendant S., at whose house he boarded, told the defendant M. that the plaintiff had a disease and was not fit to marry, and, at M's. request, made a similar statement to his daughter and family. M. took the plaintiff to the office of the defendant P., who was M's. nephew and a physician, and who examined the plaintiff, and told him privately that he had gonorrhea, and repeated the statement

[1] Marriott *vs.* Plympton, 44 N. E. R. 992.

in the presence of M. The same statement was repeated to M's. daughter and family, both by M. himself, and by P. at M's. request, and both M. and P. made substantially the same statement to some other persons. The plaintiff's engagement of marriage was broken, and he brought the actions, one of which is against M., P., and S. jointly, for causing the breach of the engagement, one against M. for slander, one against P. for slander, and the other against P. for negligence in making the examination. At the trial the jury found specifically that the plaintiff did not have a venereal disease, and that neither M. nor P. was actuated by express malice, and, under the direction of the presiding justice, rendered a verdict against the plaintiff in each case.

On appeal from the judgment entered on the verdict in each case, the Supreme Court said: "Considering, first the suit in which the three defendants are joined, there was no evidence of a conspiracy, and no evidence that the defendants P. and S. joined each other in doing any of the acts which the evidence tended to prove. The wrong charged is not like a trespass or assault, in which all are principals, but one which must be the joint act of all the defendants, either in fact or in legal intendment and effect, or the plaintiff cannot recover. There having been no conspiracy, and no such connection between the three defendants as could make the acts of each the joint acts of all in legal intendment and effect, and no act was in fact the joint act of all, the plaintiff did not show a joint tort, and it was rightly ruled that the action could not be maintained.

"In the action for slander the verdicts were right. With a possible exception, all the occasions upon which the defamatory words were used were conversations relating to the plaintiff's engagement of marriage, or to his connection with the Sunday-school, the Society for Christian Endeavor, or the church, and under circumstances which justified the defendants in communicating the information given, so that the absence of express malice was a defense. While P.'s conversation with W. is not shown by the bill of exceptions to have been privileged, the bill does not state that the latter was not a member of one of the religious bodies mentioned. Assuming, however, in favor of the plaintiff, that there was no privilege on that occasion, the words which the evidence tended to show were spoken were not substantially charged in any count of the declaration, and it sufficiently appears that they were not the wrong charged in either count. If the evidence of them was admissible, it was only for the purpose of showing express malice, and the jury found that there was not such malice.

"In the action for P.'s negligence, however," says the Supreme Court, "the verdict must be set aside. The evidence tended to show that he was employed by M. Having undertaken, for compensation to be paid by another, to examine the plaintiff, and to report whether he was diseased, the defendant was bound to have the ordinary skill and learning of a physician, and to exercise ordinary diligence and care; and if he failed, and the plaintiff was injured because of his want of such skill and learn-

ing or his want of such care, the defendant was answerable to him in damages. In our opinion, the fact that the purpose of the examination was information, and not medical treatment, is immaterial; and the breaking of the plaintiff's marriage engagement, in consequence of the wrong diagnosis, was not too remote a damage to sustain the action. Upon the evidence, it was for the jury to say whether the defendant used ordinary care, learning, and diligence." The result was that the exceptions in this action were sustained, thus affirming the liability of the physician under the facts disclosed by the evidence; while in the other three actions the exceptions were dismissed.

BOOK REIVEWS.

THE FUNDUS OCULI, WITH AN OPHTHALMOSCOPIC ATLAS ILLUSTRATING ITS PHYSIOLOGICAL AND PATHOLOGICAL CONDITIONS. By W. Adams Frost, F.R.C.S., Ophthalmic Surgeon, St. George's Hospital; Surgeon to the Royal Westminster Ophthalmic Hospital. Quarto, pp. xviii, 219. 46 figures in the text, 47 full-page plates with 107 colored figures. Edinburgh and London: Young J. Pentland; New York: Macmillan and Co. 1896. Price: $18.00.

Realization that the ophthalmoscope is an instrument intended for general use, and appreciation of the infrequency of its employment by those who should make use of it in ordinary routine examination of general disease, have been the two principal reasons why the author has deemed it wise to teach graphically in this manner those who do not have the daily privilege of seeing and studying large numbers of living cases in the ophthalmic clinics.

The chief claim of the work—and a just one too—is the careful manner with which "physiological variations" have been studied, thus giving a much broader basis of knowledge upon which to place the abnormalities and diseased conditions so constantly met with. As the reviewer has constantly told his students, the greatest fault in teaching the art of ophthalmoscopy, "is one of omission, *i. e.*, where the student is never taught to obtain a normal basis upon which to place the pathological picture" that will be constantly met with. As he has had occasion to say once before, "In fact, here, just as elsewhere, it is the recognition of slight departures from health that renders the ophthalmoscopist the most successful; it is the minute and ordinarily unrecognized peculiarities in the incipient stages of disease, that give the examination its greatest value." Faithfully carried out in such a spirit, the book comes before us.

Devoting nearly one-third of its contents to physiological variations, the balance of the subject-matter is given to the consideration of pathological conditions. The body of the work is well written. It is concise and always to the point. The list of illustrations, including some forty-six figures in the text, taken in part from various well-known authors, and embracing an exceedingly varied collection of one hundred and seven chromolithographs of original water-color sketches distributed on forty-seven full-page plates, make the collection not only a wonderfully rich one, but one that will be extremely difficult to ever duplicate. For the painstaking and conscientious manner in which all has been done, the reviewer can do no less than congratulate the author, his assistants,

and the publishers upon their monumental production; a work which he knows from experience must have cost many weary hours of clinical study and zealous research.

The book is a necessity to all inquiring students and progressive practitioners. It is one that is well worthy of the name and price. Written by an author of international reputation and arranged by a clinician of vast and varied experience, the subject-matter assumes a value that has not been attained before by any similar publication. The sketches themselves, faithful to life in the original, are exquisitely, and, in many instances, faultlessly reproduced by that most chimerical of handmaids—chromolithography. The text is so conservative in thought, so amply sufficient in description, and so certain in its teachings, that the work must at once assume in the English language a position which is sure of distinction and certain of success.

C. A. O.

A Treatise on Surgery by American Authors, For Students and Practitioners of Surgery and Medicine. Edited by Roswell Park, A.M., M.D. Vol. I., General Surgery, pp. 799. Vol. II., Special or Regional Surgery, pp. 804. Lea Brothers & Co., Philadelphia and New York, 1896.

This work is designed not only for students but is intended to supply practical information to the surgeon as well as to the general physician who may seek it. Indeed the practical nature of the work impresses itself immediately upon the reader, even though he glance but hastily over its pages, while after an attentive reading of the various articles which go to make up the book, his first impression is only deepened, and he is well satisfied that both editor and collaborators have succeeded in the effort to present their several subjects in a thoroughly practical manner. The achievements of modern investigation and the methods of modern surgical practice are throughout clearly set forth, and each article in the book is well up to the times.

Volume I., which deals with General Surgery, is divided into five parts. In Part I. is discussed Surgical Pathology; Part II. is devoted to Surgical Diseases; Part III. to Surgical Principles and Methods and Minor Proceedings; Part IV. to Injury and Repair; and Part V. to Surgical Affections of the Tissue-Systems.

To this volume the editor contributes a goodly share, over one third of it being from Dr. Park's pen. Of the sixteen chapters in Parts I. and II., he has written all except two. He divides the subject of Surgical Pathology into five chapters. Chapter I., Hyperemia, its Consequences and Treatment; Chapter II., Surgical Pathology of the Blood; Chapter III., Inflammation; Chapter IV., Ulcer and Ulceration; and Chapter V., Gangrene. No surgical writer of the present day is better fitted than Dr. Park to have written upon these subjects, and he presents them in the full light of modern pathology, clearly and attractively. The separation of the subject of hyperemia from inflammation is thoroughly in line with the doctrines of bacteriology, and practically is a wise division of the processes. The chapter on the Surgical Pathology of the Blood, including, as it does, a description of the methods of blood examination, is a valuable addition to the book.

Of the eleven chapters included in Part II., nine are contributed by Dr. Park. Chapters VI. and VII., on Auto-Infection especially in Surgical Patients, and the Surgical Fevers and Septic Infections, will be read with particular interest and profit. The treatment of the subject of Surgical diseases common to man and the domestic animals, Chapters VIII. and IX., is thoroughly practical and satisfactory. Shock and Collapse, Chapter XII., are likewise well presented, and next fol-

lows an interesting chapter on Scurvy and Rickets. The grouping together into one chapter, Chapter XIV., of the Surgical Aspects and Sequelæ of other Infections and Diseases, will be found very useful for practical reference. Chapter XV., on Poisoning by Animals and Plants, gives the reader a condensed view of all that is known on those subjects, while in Chapter XVI., Dr. Park happily presents an account of Acute Intoxications, including Delirium Tremens. The chapter on Syphilis, Chapter X., by John A. Fordyce, M.D., is an excellent one throughout, condensed sufficiently and thoroughly available for reference by the practitioner. W. T. Belfield, M.D., contributes Chapter XI., on Gonorrhea and its Sequelæ, and deals with his topic so as to present its main features satisfactorily, and yet compactly. The absence of the host of recipes that usually adorn articles on this subject is to be commended.

Of the five chapters in Part III., the first two are by John Parmenter, M.D., Chapter XVII., on the Control of Hemorrhage; Abstraction of Blood; Paracentesis; Counter-Irritation; and Chapter XVIII., on Minor Surgery and Bandaging. They give a good account of the subjects included, with the exception of that of bandaging, which is very briefly disposed of. The next chapter, on Anesthesia and Anesthetics, is contributed by H. A. Hare, M.D., and is one of the best practical articles on the subject we have seen. This is followed by a chapter on Surgical Diagnosis by Chauncey P. Smith, M.D., and next is a short one on the Methodical Report of a Surgical Case, by Edmond Souchon, M.D. Both are well written and are useful additions to the volume.

The four chapters of Part IV., Chapter XXII., on Subcutaneous Injuries, Contusions, Lacerations, etc., Chapter XXIII., on Gunshot Wounds, Chapter XXIV., on Processes of Repair, and Chapter XXV., on the Treatment of Wounds, Antiseptis and Asepsis, are from the pen of C. B. Nancrede, M.D. All are written in the clear, thorough style that characterizes all that this well-known writer has contributed to surgical literature, and are not only of the highest merit, in that the subjects are treated in full harmony with the advances of surgery, but are sound, practical articles on these important topics.

The first chapter in Part V. is by Dr. Park, on Cysts and Tumors, and is a very satisfactory *exposé* of this part of the field of surgery. An appendix describes the recent advances in inoculation methods, the serum-therapy of cancer, and treatment by anilin preparations. Chapter XXVII., on Surgical Diseases of the Skin, by W. A. Hardaway, M.D., is admirably written, and covers the ground fully. Burns, Scalds, and Frost-Bites, and their Treatment are the subjects included in Chapter XXVIII., by John Parmenter, M.D. The pith of these matters is well stated and sound advice as to treatment given. Herbert L. Burrell, M.D., contributes the next chapter, which is an excellent one on affections of the Muscles, Tendons and Tendon-Sheaths, Bursæ and Fasciæ. Chapter XXX., on Injuries and Diseases of the Lymphatic Vessels and Nodes, by F. H. Gerrish, M.D., is very creditable and interesting. James M. Halloway, M.D., contributes next after this a chapter on Injuries and Diseases of the Veins that is full of practical import. Injuries and Diseases of the Arteries, including Aneurism, are the subjects of the next chapter, by Duncan Eve, M.D. It is most thorough, and deals very satisfactorily with the surgery and pathology of these important conditions. Joseph Ransohoff, M.D., is the author of the next chapters, XXXII. and XXXIII., on Injuries and Diseases of the Joints and Joint Structures. They are very valuable contributions to the work, clearly written, systematic, comprehensive, and sound. The descriptions of operations are happily made. The article next following is another by Dr. Park, the subject being Surgical Diseases of the Osseous System. There is no affection included

under this head that does not receive ample attention. The chapter is one that will be consulted and relied upon with satisfaction. The concluding chapters of this volume, XXXVI., on Fractures and XXXVII., on Dislocations, are written by H. H. Mudd, M.D. These are subjects on which the general practitioner, especially if remote from medical centres, not infrequently needs to refresh his memory by consulting some authority. Dr. Mudd writes in a clear and conservative style, and gives a fair presentation of the teaching of the day.

Volume II., Special or Regional Surgery. The first chapter is by Dr. Park, on Injuries and Surgical Diseases of the Head. The wonderful advances that have been made in this department of surgery are such as to require, in an article written at this time, the making of statements in many particulars, especially as to operative interference, quite contrary to those taught years ago. Dr. Park admirably succeeds in presenting this great subject in its new light. Soundness and conservativeness are happily combined with a fair statement of the practice of the first surgeons of the day. The status of the newer procedures—lumbar puncture, operations for defects of intra-cranial development, and the surgical treatment of epilepsy and the psychoses—is judiciously given. E. H. Bradford, M.D., is the author of the next article, on Injuries and Surgical Diseases of the Spine, together with the Surgery of the Peripheral Nervous System. In the discussion of these topics the reader again expects to find much that differs from the older authorities, and in this he is not disappointed. The whole field is thoroughly gone over. As to spinal operations, their limitations and technique are well explained. Chapter III., by Duncan Eve, M.D., on Surgical Diseases and Injuries of the Heart and Pericardium, with Surgery of the large Blood-vessels; Ligations, is a fit companion to the chapter contributed to Volume I. by this writer, and is of equal degree of merit. A thorough-going chapter on Surgical Diseases and Injuries of the Respiratory Organs, by D. Bryson Delavan, M.D., follows. So carefully are the various affections and emergencies occurring in these organs discussed, that the article, which is fully abreast with the knowledge of the times, will commend itself most favorably to the reader. Chapter V., by Edmond Souchon, M.D., on Diseases and Injuries of the Face, and of the Neck, describes in a compact manner the various malformations, diseases, and injuries met with in these parts. The style is such as preëminently appeals to students. The descriptions of operations might, however, have been made a little more full with advantage. Surgery of the Chest is the subject of Chapter VI., by Frederic S. Dennis, M.D. This article gives a very complete account of the many affections and traumatisms met with in this region, and is attractively written. The indications for, and manner of performing the operations are admirably given. Arthur D. Bevan, M.D., contributes the next chapter, which deals with Diseases and Injuries of the Mouth, Tongue, Teeth, and Jaws. It is a good article, and its value is increased by the addition of an appendix on Early Operations for the Closure of Cleft Palate, by Truman W. Brophy. M.D., D.D.S. Chapter VIII., on Surgery of the Abdomen, by Maurice H. Richardson, M.D., assisted by Farrar Cobb, M.D., is so complete and entirely in harmony with modern surgery as to merit the highest commendation. The remarkable advances in the surgery of the abdominal viscera are impressed most forcibly upon the reader, who will find this paper filled with sound advice. Chapter IX., on Hernia, by Dr. Richardson, is also entitled to a generous share of praise. From every point of view it is a most superior paper. Modern operative procedures are fully described. We are glad to be able to note, however, this temperate expression with regard to recurrence of inguinal hernia after operation for radical cure: "Under modern methods recurrence after operation

for radical cure has become infrequent, though it remains to be seen whether the results will still be as good after the lapse of years." Diseases of the Rectum and Sigmoid Flexure are discussed by Charles B. Kelsey, M.D., in Chapter X., and are presented fully and satisfactorily by this experienced surgeon. Chapter XI., on Genito-Urinary Surgery, by William T. Belfield, M.D., supplies a good account of this branch of surgery, and omits nothing new. On one topic, operations for the relief of enlarged prostate, which has received much attention in recent times, the writer expresses himself in a conservative and judicious manner. He makes no enthusiastic statement of the results of double castration or ligation of the vas deferens, believing that the latter should be substituted for the former "as a purely tentative procedure," and that the former should not be done "until the bladder has been opened and explored by the finger."

Chapter XII., by Dr. Park, is a brief, but good one on the Chancroid or Venereal Ulcer. Chapter XIII., by James H. Etheridge, M.D., is on the Surgical Diseases and Injuries of the Female Reproductive Organs. It goes well over the subjects included, and is a sound practical article. Diseases and Injuries of the Breast are the subjects of the next chapter, the author of which is Charles B. Parker, M.D., and are well and faithfully described. Thorough and extensive operation for the removal of malignant disease is insisted upon, as it should be. The subject of Amputations is that of the next chapter, by Rudolph Matas, M.D. It is very thorough, and the descriptions are plain and easily followed. Chapter XVI. treats of Orthopedic Surgery, the author being Robert W. Lovett, M.D. It contains a remarkably full account of all that belongs to this department of surgery, and both as to the mechanical treatment of deformities and their operative relief, it is an excellent guide. Chapter XVII., on Plastic Surgery, is written by Arpad G. Gerster, M.D., who succeeds in making the subject interesting as well as clear. The methods of closure of defects of almost every conceivable shape are made plain by numerous diagrams. The next two chapters, XVIII., on Surgical Injuries and Diseases of the Eye and Orbit, by Charles Stedman Bull, M.D., and XIX., by Clarence J. Blake, M.D., on Surgical Injuries and Diseases of the Ear, both of which contain a sufficiently full account of their subjects, put before the reader such knowledge of them as the general surgeon or medical man of the day should possess. They are very valuable contributions to the work. The concluding chapter, on Skiagraphy, by the editor, well describes the application to surgery of this wonderful discovery.

Of the work as a whole, we repeat what we said in the beginning, that in the effort to be practical it is a complete success. The arrangement of subjects is good, and overlapping is avoided as far as possible. Although, as stated in the preface of Volume I., each volume may be procured separately, we are convinced that any one who has one of them will find it so satisfactory that he will want the other. Illustrations are generously used, and the engravings are all of them praiseworthy. The effect of some of the colored plates, of which there are quite a number, is, in certain instances, marred by the colors being too bright. Notable examples are, in Volume I., those illustrating the Initial Lesion of Syphilis, Early Rupial Syphilide, Aneurism of the Aorta showing Lamination of Clot, Acute Osteo-myelitis, and, in Volume II., those depicting Extradural Clot in Compound Fracture of the Cranium with Depression, Intraspinal Hemorrhage, Sarcoma of the Spine and Cord, and the various degrees of involvement of the Appendix Vermiformis. In all of these the red, especially, is far too intense. This fault of excessive coloring is common with many of the colored illustrations that are produced at the present day, and it is hoped will eventually be corrected.

We extend to Dr. Park and his collaborators our hearty congratulations, and feel sure that their production will soon win for itself the favor that it deserves.

T. R. N.

THE DISEASES OF THE MALE URETHRA. By R. W. Stewart, M.D., M.R.C.S. New York: William Wood & Company, 1896. 8vo., pp. 221.

This little book is intended by its author to present the subject of diseases of the Urethra "as viewed from the modern standpoint," facts already well established receiving due prominence. It discusses only the subjects of Acute and Chronic Urethritis, some of the complications of Urethritis, and Stricture of the Urethra.

Anterior and Posterior Urethritis are very properly considered separately, the acute and chronic form of each receiving due attention. As to the treatment of Acute Anterior Urethritis, although a fair *résumé* is given, the writer does not, in his description of his routine plan of treatment of an uncomplicated case of gonorrhea, place himself on record as advocating the antiseptic methods now so generally employed. In the matter of the employment of sounds for the treatment of Chronic Urethritis, the views of Otis with reference to the relationship existing between the circumference of the penis and urethral calibre, and to the dependence of the continuance of gleet upon the existence of stricture, are directly opposed. The writer admits the necessity of having some conception of the size of the urethra in a given case, but does not furnish a very definite standard when he gives us to understand that it must be supplied by the judgment of the surgeon, and he may be considered a little arbitrary in the following statement, (p. 92): "In my own practice, *if I can pass a No. 26 French sound, without its being obstructed in its passage or held on its withdrawal, I have no hesitation in assuring the patient that he has no stricture. Even if in such a urethra I detect points of narrowing with the urethrometer, which may be classified as strictures of large calibre, I make my assurance none the less positive, as I cannot recognize a stricture which readily permits the passage of a No. 26 French sound, as being of itself the cause of any urethral disease, or requiring treatment.*" (The italics are in the original.)

Speaking of Dilating Internal Urethrotomy, a protest is entered (p. 101) "against the reckless urethrotomies that are being done, every day, for the removal of irregularities in the dilated urethra that are in themselves harmless." With this we are quite in accord in so far as the "reckless" operations are concerned; but it must always be a question to be settled by the judgment and experience of the surgeon as to how far these "irregularities in the dilated urethra" are harmful.

The subject of Posterior Urethritis is presented in a compact way in several little chapters, which are well up to date. Of the complications of gonorrhea, Cowperitis, Epididymitis, Seminal Vesiculitis, acute and chronic, and, with the latter, Follicular Prostatitis, are acceptably detailed. We think, however, that the value of the book would have been enhanced if the subjects of Acute Prostatitis and Cystitis had been included and fully described.

The last portion of the book is devoted to the subject of Stricture of the Urethra. Little stress is laid upon the value of Strictures of large calibre, and the views of Otis in reference to the relation of gleet to stricture are again taken exception to. As to the treatment of strictures of small calibre, which, as defined by the author, "*are those points of narrowing in the urethra which are of sufficient extent to retard the flow or narrow the stream of urine*" (italics in the or-

iginal), dilatation is regarded as preferable to urethrotomy when the urethral calibre can be restored equally well by its employment. The description of the management of deep strictures of very small calibre is clear, and in his disapproval of their division by Maisonneuve's urethrotome, the writer is supported by good authority. External urethrotomy for impassable Strictures is clearly explained, but the subject would have been more fully covered had Cock's operation been alluded to. Retrograde catheterization is advised in those cases in which, after due search, the lumen of the Stricture cannot be found. We cannot see why, when it is possible to open the urethra behind the stricture, as it is with the very rarest exceptions, at the apex of the prostate, the risk of a supra-pubic cystotomy should be added to that of the perineal operation.

T. R. N.

A Treatise on Obstetrics for Students and Practitioners. By Edward P. Davis, A.M., M.D. Lea Brothers & Co., Philadelphia. 1896.

This work is a very good treatise on obstetrics, from the mere practical standpoint; we think, however, that a great deal more might, and should have been said on the theoretical side of the subject. This is exemplified in the section devoted to puerperal infection, where the author reproduces the plates of Bumm and Gaertner, but where we fail to find in the text any reference to, or explanation of these plates, or notice of the work done by these investigators. There are, at present, so many good text-books on practical obstetrics that when a new one comes out we are disappointed in not finding more reference to the recent work done in the lines of pathology and bacteriology.

The author has adopted a simpler method of classification than is usually found in such books, and has divided his work into sections on Pregnancy and Labor, Pathology of Labor, Obstetrical Operations, Abortion, the Puerperal State, etc., and Infancy.

The chapters on obstetric diagnosis and the pathology of pregnancy are particularly good, and we can fully agree with the author in advocating the routine practice of pelvimetry in both hospital and private practice.

In the management of normal labor the author says, "in normal cases no preliminary vaginal douche is necessary;" with this we entirely agree, but think that in the present state of conflicting opinion on this subject, it might have been better had he given some of his reasons for such a statement. On the other hand we do not agree with the author on the propriety of giving a copious vaginal douche after labor.

In the section on Forceps and Version, the author has used a number of the plates of Farabeuf and Varnier without explaining in the text what these writers intended their plates to show. We are rather surprised to note further, that he does not, in any portion of the work, advise the boiling of obstetrical instruments, but simply says that they should be thoroughly scrubbed and placed in an antiseptic solution.

The subject of Contracted Pelvis, and Pelvis Disproportionate to Large Child, are much better treated than in most similar works, the latter being often omitted.

He concludes with a valuable section on the jurisprudence of obstetrics, which is another subject rarely found in obstetrical text-books, and one which should be more generally treated.

The work is profusely illustrated and well gotten up. As a whole, it will be valuable to the student and to the busy practitioner who wants to get a good general idea of a case without going deeply into its etiology and pathology, but as a work of scientific or theoretical value it might well be improved on.

G. W. D.

PRACTICAL DIAGNOSIS: THE USE OF SYMPTOMS IN THE DIAGNOSIS OF DISEASE. By Hobart Amory Hare, M.D., B.Sc., Professor of Therapeutics in Jefferson Medical College. Lea Brothers & Co., New York and Philadelphia, 1896. pp. 566, 8vo. Cl., $4.75.

This is a volume of great practical value. It easily ranks with the well-known works of DaCosta and Musser in the same field, and is destined for wide acceptance as a reliable guide for the student and practitioner. The author's experience in the ward-class and in the lecture room has given him a facility for imparting the truths of medical knowledge, and by his devotion to medical literature he has acquired an easy style and clear diction that will ensure a wide use of his books.

The plan followed is first to discuss the symptoms used in diagnosis and then to apply them so as to determine the character of the disease. Thus the discovery, by the physician, of any marked symptom naturally leads to the heading under which that symptom is considered, and from the discussion of its various causes and the use of tables of differential diagnosis a conclusion may be reached. In this way, in a measure, it is not necessary first to make a suppositious diagnosis. There are two indices, one of symptoms and one of diseases. There are 191 engravings and thirteen colored plates. A large number of the illustrations are original and are taken from the author's own cases. He has had the benefit of many others taken from the works of Dercum, Osler, Henry, Thorburn, Head, Flatau, de Schweinitz, and other recent publications.

The opening chapter gives some sensible advice in regard to eliciting the history of the patient, and will be read with profit. Part I. treats of the manifestation of disease in organs. In this the author takes first the face and head, then the hand and arm; the feet and legs, hemiplegia; the mouth, tongue, and pharynx; the eye; the skin, and so on through the various regions of the body.

In Part II. he discusses the manifestation of disease by symptoms, considering first fever, then headache and vertigo, coma, convulsions, vomiting, cough, pain, and so forth.

We naturally look for certain subjects and, as a rule, we find them well arranged and useful in given cases. A very few subjects are omitted. Among these we may mention the absence of reference to a few well-known terms which students will no doubt want information upon, as, for instance, Brown-Sequard paralysis, the Aran-Duchenne type of atrophy, the latter being described in general terms in the section on the hand. Romberg's symptom ought to be mentioned in the index, although it is very casually referred to in speaking of locomotor ataxia. Here, too, station or the sway of the body might well be noticed as it appears in health and in disease. As far as we can find, no reference is made to erethromelalgia, chin-or jaw-jerk or ear-cough. There are two very good Röntgen ray pictures and doubtless subsequent editions of all our works on diagnosis will be greatly enriched by illustrations from this prolific source; with such we will expect to find one showing the dermatitis now observed after the use of the X-rays, and the anatomical basis for the painful affection known as "Morton's toe." Another subject which might be included is the diagnostic value of excessive fat.

In discussing "Wernicke's pupil" the author locates the lesion in the "right arc," but does not specify to begin with which eye he proposes to examine. In this connection we may say that, strictly speaking, it is always the iris which contracts, and not the pupil, as the latter is, of course, a space and not a structure.

The vast amount of labor and the skill required in the production of a book of this kind never can be appreciated by the ordinary reader. We consider it a valuable addition to our armamentarium. G. H.

NOTES AND NOTIONS.

The Blight of the Placard.

To the mind that has not yet acquired official astigmatism, nothing seems plainer than the evil effects of the yellow placard; it is the "poster" of disease, without esthetic merit, and our legislation against contagion would be much more effectual without it, for what we want is to get at disease, its actual amount, its light, as well as its severe, manifestations, and a concealed case does more mischief than a known one. Now, the reporting of cases should be encouraged, official visitation might properly follow the report, and careful survey of premises and sound advice about precautions against further spread; but where is the gain from the placard? To most minds it stands for a warning—of what? Not to consider any case contagious till surely so; not to let it unnecessarily blight its limited field; for the dread of the placard prevents an early resort to medical advice; and the more it is employed the more it will do so. It makes the physician justly hesitate to pronounce a case as coming under a certain specified name unless he is hopelessly convinced. The stake is too large to risk it on an uncertainty. On the one side, for the doctor, the possibility of human error; for the family who should summon him, the possibility that delay may be dangerous: on the other, *optimism* first; next, the dread certainty that, if contagion is diagnosed, there will follow a loss of many things held dear as life,—business, work, situation, wages, schooling, social enjoyment; in tenement houses, paralysis of many; in hotels and apartment houses, ostracism, damages, or ejection to nowhere; in business, the destruction in a day of the built-up trade of years, or loss of professional clientage. Who with common sense would hesitate to wait as long as possible; to choose, with man's underlying optimism, the way that waits, and hopes, and leaves one free to work, and walk, and breathe the outer air and meet the smiles of friends; or confinement and suspense and the shuddering glances of all? For all this the placard does: puny yellow scrap, it sits in glory, with malignant eye, and, like a deadly providence, blights its little world. It makes sickness often worse than crime and death, rousing up and strengthening in the hearts of average men and women the underlying fear of personal danger, and it cuts down at a sweep the honest virtues of courage, and helpfulness, and brotherly kindness, and all we call humanity; it nourishes selfishness, and in its little realm rings round and shuts in with its glamor the things worse than death and bars out the things better than life; and how much good does it do, conveying as it does an exaggerated idea of danger where often danger is trifling; while the crowded street-car when its doors are shut and the ugly corner inlet, vomiting out its miasm, though worse, are unplacarded. A hundredfold worse may be the draught of milk,

brought by the unplacarded milkman, or the ice-cream that tempts the thirsty child on a sultry day; yet, for a refinement of biological discovery in some tiny throat, it dooms a family to isolation and ruin, while the milkman, as he goes his rounds past the door with its yellow patch, smiles with a bacillary and microbic smile.

EDWARD WILLARD WATSON.

A Dependent Profession.

WE learn from the report of the bacteriological department of Philadelphia that there is a tendency, on the part of physicians sending in culture tubes from suspected cases of diphtheria, to rely more and more upon the diagnosis of the department. This certainly suggests the unpleasant idea that, as the department by this means reaches out for the diagnosis of more diseases, the tendency to rely on it will increase, and diagnosis become the prerogative of a select few salaried by the city or state or nation. Treatment too will fall in rank behind and wait the mandate of the same power. National institutes will flow with serum of various kinds for the healing of the nation. Thus by a fine union of medicine and the state the business of the doctor will be swept away. In this, medicine but follows other things, and the future will see it thoroughly transformed into an autocracy on the German plan with civic and national authority back of it. The drudgery of the work outside the laboratories will be done by the ignoble herd for nothing, but the aristocracy of medicine will scan cultures and slides, and issue their edicts of quarantine, removal, isolation, what they will. It is growing hard now to be sick; it will then be deadly. Man will hold his life, his freedom, his business, only at the whim of the medical despot. And why are we coming to this? Why do physicians "rely" more and more on the diagnosis given by the Board of Health? The answer is obvious: because they cannot well do otherwise. If they make a negative diagnosis the Board may upset it, right or wrong, and discredit the doctor in the eyes of his patient; or, just as likely, if he diagnose diphtheria, it chooses to find no bacillus, though sequelæ follow just the same. It is wonderful always how the helpless agree and depend upon despotic and arbitrary power. Now, we might endure without flinching the early rays of this coming dawn that threatens the medical world, were we quite sure the sun was rising and not a fire-ball. If only the diagnosis of bacteriologists could be implicitly trusted! But, on the contrary, there is more than a growing suspicion that they have not yet discovered the true road. They find diphtheria in everything, tubercle-bacilli everywhere. How many men, outside the ring who are committed to it and are floating on its wave to transient success, believe that antitoxin is a perfect antidote to diphtheria? How many who thought well of it have lost faith? The sceptical have to contend now, not with uncertain theories only, but also with vested interests and invested capital, with a hidden power that floods the medical

journals and daily press with encomiums and wonderful successes, and loads the doctors' daily mail with monographs in the interest of the manufacturers of serum, till the bewildered medical profession finds itself beating in vain against the cage of wires that monopoly and sordid interest have woven about it while it slept and dreamed.

EDWARD WILLARD WATSON.

THE publishers of this MAGAZINE received some time ago the following letter from the proprietors of the *xyz* medicine:

How Some Magazines get their Advertisements.

"*Gentlemen:* This company is about to take up a line of advertising in certain medical journals. We have the following proposition to make: We will take space in your journal, one-half page for one year, at $65.00, payments to be made monthly in advance. This provided: We are furnished with a line from the editors of your journal, and others contributing to its pages who are in active practice, with their personal address, and address of the druggist to whom the most of their prescriptions go. To these druggists we will forward, at our own risk, a supply of our *xyz* medicine. To the physician we will send three bottles of the medicine for experimental use in his practice. If the medicine prove to be all we claim for it, the physician, we presume, will be glad to prescribe it and we will learn of this fact through the druggist. We will thus be enabled to ascertain if the promises which are so frequently made us by the managers and editors of the different medical journals in which we advertise, that they will take a real interest in our products and prescribe them, are sincere. In regard to the merit of the *xyz* medicine, there is in your mind probably no question. They have been used by the profession for over ten years. In any event, the samples we send you will suffice to satisfy you whether they are worth or not this trial.

Yours truly,"

Xyz Medicine Co.

It is needless to say that the request was not complied with, though we are sorry to note that the advertisement has appeared in the pages of some of our esteemed contemporaries.

CATTELL.

THE twenty-fifth Annual Meeting of the American Public Health Association will be held at Philadelphia, Pa., October 26, 27, 28, 29, 1897.

American Public Health Association.

The Executive Committee have selected the following topics for consideration: I. The Pollution of Water-Supplies. II. The Disposal of Garbage and Refuse. III. Animal Diseases and Animal Food. IV. Car Sanitation. V. Steamship and Steamboat Sanitation. VI. The Prevention of the Spread of Yellow Fever. VII. The Transportation and Dis-

posal of the Dead. VIII. The Relation of Forestry to Public Health. IX. Nomenclature of Diseases and Forms of Statistics. X. Cause and Prevention of Infectious Diseases. XI. Public Health Legislation. XII. Cause and Prevention of Infant Mortality. XIII. Transportation of Diseased Tissues by Mail. XIV. River Conservancy Boards of Supervision. XV. The Period during which each Contagious Disease is Transmissible, and the Length of Time for which each Patient is Dangerous to the Community. XVI. Sanitation, with special reference to Drainage, Plumbing, and Ventilation of Public and Private Buildings. XVII. Some Method of International Arrangement for Protection against the Transmission of Infectious Diseases. XVIII. Disinfectants. XIX. Existing Sanitary Municipal Organizations of the Countries belonging to the Association, with a view to a Report upon those Most Successful in Practical Results. Papers presented to the Association shall be confined strictly to sanitary, climatologic, and preventive questions, all clinical, pathological, therapeutic, or other strictly medical statements being excluded; nor shall any paper tending to the advertisement of special or local interests or establishments be accepted. All communications relating to local matters should be addressed to Dr. Benjamin Lee, Chairman Local Committee of Arrangements, No. 1532 Pine St., Philadelphia, Pa.

HINSDALE.

A Case of Fatal Poisoning by Ammonium Hydrate.

A MUSCULAR man drank by mistake a large quantity of ammonia. Besides the local caustic action of the drug upon the mucous membrane of the lips, mouth, and intestinal tract, the following interesting features were developed during the performance of the autopsy. 1. When a rod dipped in hydrochloric acid was introduced into the abdominal or cranial cavity or was brought near the mouth, the whitish fumes of ammonium chloride were given off. This test could no doubt be used to advantage during life for the differential diagnosis of ammonia poisoning from poisoning by other caustics. A piece of moistened red litmus paper, on being brought near the intestine, showed the alkaline reaction by immediately becoming blue. 2. The action of an irritant could plainly be felt upon the hands as the intestines were handled. A small scratch which had not been discovered was revealed by the burning sensation. 3. The blood was fluid and of a distinct scarlet color. 4. The intestines and the liver were deeply discolored, such as one sees when decomposition is well advanced, owing to the precipitation of the iron in the hemoglobin by the sulphuretted hydrogen produced by the decomposition of the tissue by the aid of bacteria in the intestinal tract. As the post-mortem was performed sixteen hours after death and proper care had been taken of the body, it is but right to suppose that the ammonia had precipitated the iron and sulphur of the blood in the form of a sulphide.

CATTELL.

Post-mortem Discolorations which were Mistaken for Bruises.

Writing the note upon the bluish discoloration produced in the abdominal cavity by ammonia, reminds me of a case of perjury in which I was recently called upon to testify. A woman upset a lighted lamp with the result that her clothes caught fire. She cried for help, and her husband was finally able to extinguish the flames by wrapping her in a piece of carpet, severely burning himself, however, in so doing. After the best of medical care, the woman died a few days later from exhaustion following the burns. After the coroner's jury had found that the death was due to accidental burns and the woman had been buried, a jealous relative had the case reopened, swearing that the husband of the deceased had beaten his wife, as she had seen upon the abdomen of the deceased extensive bruises which could only have been produced by extreme violence, and that she believed the woman had been beaten, and that to cover his crime the husband had then set her dress on fire. The body was exhumed and at the post-mortem no signs of traumatic injury were found upon the abdomen, but the discoloration of the superficial tissues so characteristic of decomposition was discovered. Both the undertaker and the woman who had laid the body out had noticed the discoloration and recognized it as due to post-mortem change, and the physician who had treated the case had observed no discoloration in this region while the patient was under his care. In this connection it is well to call attention to the fact that I have seen cases of purpura and scurvy in which these diseases produced lesions similar in their appearance to bruises.

Cattell.

NOTE TO CONTRIBUTORS.

Authors will receive liberal compensation for all accepted articles after publication; or 250 reprints, if asked for on the manuscript, will be furnished in lieu of the honorarium. It is distinctly understood that all articles appearing as original matter are for our exclusive use, and are not to be reprinted or to appear in any other publication excepting the Transactions of the Society before which the paper may have been read. Illustrated papers are especially desired.

All matters of business, as well as subscriptions, should be sent to the International Medical Magazine Company, 3709 Spruce Street, Philadelphia.

Manuscripts, exchanges, and books for review should be addressed to the Editorial Office, 3709 Spruce Street, Philadelphia.

INTERNATIONAL
MEDICAL MAGAZINE.

Vol. VI.] JULY, 1897. [No. 6.

ORIGINAL COMMUNICATIONS.

CHOICE OF A SUMMER RESIDENCE IN NEW ENGLAND.[1]

BY FREDERICK I. KNIGHT, M.D.,
Boston, Mass.

WITHIN the recollection of our older members it was customary for most well-to-do people, those even who lived in large cities, to fit up their houses with shutters and awnings and make themselves as comfortable as possible at home during the greater part of the summer season; perhaps going away for a few weeks to Saratoga, White Sulphur Springs, or other such resort. The children were sent out early in the morning and put to bed in the middle of the day, and the whole family took to the front door-steps for a breath of cool air in the evening. A few of the richer people had houses in the country suburbs of their own cities; but the establishment of a separate independent summer home, often at a great distance from the winter one, is a very modern practice. The dominant idea seems to be to escape the intense, exhausting heat of the cities and low inland country, and the entire New England coast and the best parts of its mountainous tracts are being rapidly pre-empted as cooling-off places for the rest of the country.

The places in New England which are resorted to on account of comparative coolness in summer present great differences of temperature, moisture, wind, and other climatic conditions. But little attention is, as a rule, paid to this fact, and a person goes to one place or another for no better reason perhaps than that a friend recommends it. A little thought or good advice in this matter would oftentimes be of great service, and even prevent serious consequences. Fashion has lately set the pace to the

[1] Read at the meeting of the American Climatological Association, at Washington, D. C., May 4, 1897.

seashore, but the seashore is by no means a proper summer residence for all people, and, furthermore, there are great differences in seashore places. The climatic conditions are typically different in different parts of New England. We find two kinds of country places appropriate for summer residence, viz.: places comparatively low in elevation, but far enough north to insure cool nights as a rule, and mountainous places which, according to their elevation, afford a dry, rarefied air, very free from germs, cooler days, and often very cool nights.

We find also several kinds of sea places differing greatly one from another, and indicated from very different conditions of the system. The coast climate of New England varies greatly according to the varying exposure to the south and east winds. To be cool in summer on the New England coast one must be where the south wind blows directly from the sea. As the general direction of the line of the east coast runs nearly northeast the whole coast would have the south wind from the water if it were not for the interference of the two capes, Cape Ann and Cape Cod. North of Cape Ann as far as Hampton, N. H., where the coast line begins to turn decidedly to the east, and north of Cape Cod, especially between Cohasset and Boston, the south wind comes overland, and is a hot wind; whereas, along the eastern Maine coast, north of Hampton, N. H., and south of Cape Ann towards Boston, on what is called the North Shore (*i. e.*, of Massachusetts Bay), including Gloucester, Manchester, Beverly, Marblehead, Swampscott, and Nahant, the south wind comes from the sea. As you approach Boston from Lynn the effect of the cape in meeting the south wind is felt, and at Boston it is a hot wind. On the south side of Cape Cod and along the southern coast of New England till it is modified by Long Island, one gets the south wind directly from the water. Everywhere north of Cape Cod the coast is exposed to the east and northeast winds, which may be very cold and raw. The shores of Buzzard's Bay are shielded from the east winds by Cape Cod, and Newport and New London receive the northeast wind modified by the same. The temperature of this region is consequently more equable. While the Beverly shore and the shore south of Cape Cod have the common advantage of being cooled by the south wind direct from the sea, they differ much in other respects. The air of both regions is moist, of course, but that of the Beverly shore is much colder. We all know how different the effect of cold and warm moisture is, especially in affections of the respiratory and nervous systems. The wind south of Cape Cod blows quite steadily from the sea, so steadily and strongly as to be physically disagreeable to some people.

We have also the island resorts, where the quality of the sea air is experienced more constantly and the temperature is more equable, but which differ considerably, one from another, in average temperature. The Isle of Shoals is much cooler than Block Island or Nantucket.

If all the members of a family are robust and free from individual con-

tra-indications, it will in general be found best for those who spend most of the year inland to go to some part of the seacoast for the summer, and for those who live on the shore to go inland or to the mountains. It will be seen, however, that I have mentioned three kinds of resorts by the sea:

1. The Maine coast and the Beverly shore;
2. Shore south of Cape Cod;
3. The islands;

and two in the country:

4. The mountains;
5. Country not much elevated, but quite far north.

There is often an opportunity for the medical attendant to be of great service to a family in indicating their summer residence, perhaps in reference to their characteristics as a family, or with special reference to an invalid or convalescent member. He has to choose between the simple air of the north country, the stimulating, rarefied air of the mountains, and the pure ozone-laden sea air; but here again he must choose between the island climate, the cold, stimulating air of the Beverly shore and the Maine coast, or the warm and, to some, enervating air of the south shore.

It is not my purpose to-day to go over again the different diseases and conditions of the system in which these different climatic conditions are indicated (this has been often done), but simply to call attention to their existence, especially those along the New England coast, in regard to which the people, and often their physicians, seem to be unusually ignorant.

A PERFECTED SERIES OF TEST-TYPE.

BY CHARLES A. OLIVER, A.M., M.D.,

One of the Attending Surgeons to the Wills' Eye Hospital; One of the Ophthalmic Surgeons to the Philadelphia Hospital, etc.

THE accompanying electrotype furnishes a fair miniature representation of the appearance of the third edition of a perfected series of test-letters devised and constantly employed by the writer.

In its preparation, advantage has been taken to obtain the finest plate-work, the proper color of ink, and the correct printing of the letters themselves. The choice of the material used in the construction of the card, its size, and its tint have also been carefully and conscientiously studied, in order that the best results might be obtained.

As previously shown in the April, 1893, number of the *Archives of Ophthalmology*, "The letters chosen in this series of test-type strictly conform to the five-minute angle basis of Snellen, not only in height, but also in width. Each letter has its component parts included absolutely in the one-minute angle limit of vision. The interspaces throughout the

letter-areas are also kept to the one-minute basis or more. The individual portions of the letters are blocked into their proper areas, thus avoiding the mental effort necessary to decipher complicated forms, and escaping the visual confusion produced by intricate characterization.

"Each row of type has an intentional sequence of letter-formation which alternately expresses vertical and horizontal strokes, and curved ones, thus giving a series of characters which serve for the ready detection of astigmatism.

"Each test-type is placed in the centre of a surrounding area, which is either greater or equal to the size of the letter itself. This has been done so that the test-type can in no way interfere with one another, thus preventing, just as was obviated with the parts of the individual letters, any confusion by too close approximation of the entire letter-groupings themselves.

"Each line of test-type has been made of a size that should be seen at five metres or even fractional multiples thereof, thus avoiding any useless mental calculation for the various values."

RANDOM NOTES ON THE SECOND PAN-AMERICAN MEDICAL CONGRESS, HELD AT THE CITY OF MEXICO, NOVEMBER 16, 17, 18, AND 19, 1896.

(Concluded from page 342.)

BY DAVID CERNA, M.D., PH.D.,

A delegate from the *Texas State Medical Association;* Demonstrator of Physiology and Lecturer on the History of Medicine in the Medical Department of the University of Texas, etc.

THE able memoir of Dr. William Pepper, entitled "Röntgen Rays in Thoracic Aneurism," was well received and favorably commented upon. It was briefly discussed by Dr. Mendizábal, who spoke intelligently of the new rays, considering the subject as a most important discovery and of invaluable application to the diagnosis of disease.

Dr. Luis H. Debayle, of Nicaragua, read an interesting paper entitled "Antiseptic Saturation by the Endermo-epidermic Method, with Special Regard to its Application in the Treatment of Infectious Diseases." The method consists in the saturation of the system through immersion in antiseptic solutions. The author has employed with success

well-known antiseptic substances in the treatment of gangrene, purulent infection, cystitis, and other affections. He affirms that in this manner most antiseptic drugs, provided they be soluble and capable of being absorbed, produce better results than when they are administered by the mouth or other avenues. Precautions must be taken to avoid general poisoning; hence the general condition of the patient, and particularly the state of the kidneys, pulse, and temperature, should be carefully watched. The method has been of special service, according to Dr. Debayle, in the treatment of gangrene, in which disease a well-marked antagonism between the infection and the saturation by the remedy has been observed. Laying special stress on the treatment of gangrenous infection, the author stated that if under this systematic method of saturation the temperature could be kept down for eight days consecutively, recovery would ensue; on the contrary, if the temperature be not modified at all by the second or third day of the treatment, notwithstanding the presence of all signs of saturation, the prognosis was generally grave. Intolerance to drugs, or idiosyncrasies, should never be lost sight of in the employment of this method. The paper was favorably discussed by Drs. Mendizábal and Carmona y Valle.

Marked attention was then given to the reading of a paper by Dr. A. H. Holmes, of Denver, Colorado, entitled, "Diagnosis of Tuberculosis from the Microscopic Study of the Blood." Dr. Holmes believes: 1. That the diagnosis of tuberculosis from the morphological appearance of the blood rests upon the hypothesis that each individual has a biological prototype in the leucocytes of his own blood. 2. That leucocytes are independent organisms, with functions analogous to those of the larger organism. 3. That they pass through various stages of growth and decay. 4. That disintegration of leucocytes may occur at any age. 5. That the leucocytes are tissue formers. 6. That as are the leucocytes so is the individual. 7. That tuberculosis is a disease characterized by tissue disintegration. 8. That in tuberculous blood there is abundant cell disintegration—premature development, premature decay, and more or less deviation from the normal percentages of the various types of cells. 9. That, if there is a marked disintegration in the leucocytes, we can with certainty predict a similar condition in the larger organism. 10. That tuberculosis possesses a combination of blood appearances from which a diagnosis may be made earlier than by any other means that we now possess. 11. That these may be recognized by appropriate microchemical stains and a high magnification. 12. That they can be recognized even before the disease manifests itself in the individual. 13. That they are sufficiently marked in tuberculous persons, or even in those with a strong tuberculous predisposition, to enable a diagnosis to be made from the blood alone, without knowledge of the history or physical condition of the patient. 14. That thus far no other pathological condition has been found which presents

similar blood appearances. 15. That, finally, an early diagnosis would enable many to avail themselves of favorable climatic changes, and thereby delay or even prevent the destructive results which would otherwise inevitably follow.

Professor Carmona y Valle related the history of an interesting case of acute yellow atrophy of the liver. In the course of his remarks he discussed important points regarding the pathological histology of this disease, and exhibited some very good photographic illustrations. Dr. Carmona y Valle said that on post-mortem examination the liver was found very much reduced in volume and weighed 615 grammes. It was of a yellow color, resembling washed leather, of a soft consistency, and contained very little blood. The spleen was swollen and diffluent, and the vessels were filled with dark glutinous blood. A microscopical examination of the liver showed that its cells had completely disappeared, and the hepatic parenchyma had been transformed into connective tissue, the meshes of which were entirely empty. The veins, especially the suprahepatic, had thickened walls and contained thrombi.

The prevailing idea regarding the nature of *icterus gravis* seems to be that this affection "is the visible sign of the rapid destruction of the hepatic cells, manifested by a typhoid condition with jaundice and hemorrhages." It is held that in this disease cellular destruction is not necessarily very rapid, in view of the fact that there are certain forms of *icterus gravis* which last for a year or even longer. Why is it that in cirrhosis and in simple atrophy of the liver no symptoms of *icterus gravis* occur? Again, if it be true that the hepatic cells are the sole manufacturers of bile, how is the appearance of jaundice to be explained during a process of cell destruction?

Professor Carmona y Valle has heretofore described a type of disease under the name of "Intercellular Hepatitis." This consists in a swelling and hardening of the liver, accompanied with all the phenomena of pronounced jaundice. The chief anatomical lesion which characterizes this affection is a periphlebitis beginning in the suprahepatic veins, causing obstruction of the vessels through an abundant cell proliferation, and finally destruction of the hepatic lobes. Dr. Carmona y Valle concludes, from these facts, that *icterus gravis* is produced by a disturbed circulation in the suprahepatic veins, due or not to microbian influences, and that these circulatory changes at first increase cellular function and later cause the death of the cells themselves. The progress of the disease, as well as the diversity of the concomitant symptoms, depends on the extent of the lesion and the form of the phlebitis.

Dr. Silvio Tatti, of Buenos Ayres, presented a paper under the title of "A New Clinical Sign." The new sign is said to be observed when the legs are crossed in a natural position of rest. It is affirmed to be characterized by an oscillatory movement plainly seen at the extremity of the

foot. This movement is likewise produced when the subject experimented upon is seated on the edge of a table, without crossing the legs. A tracing can be obtained by means of a Dudgeon's sphygmograph slightly modified. The sign is apparently physiological, since it occurs in persons of all ages. It is not due to compression of the vessels, as might be supposed. In normal individuals the number of movements almost coincides with that of the radial pulsations, although it is not quite as large. The modified form of the sphygmograph spoken of is placed transversely over the foot and fixed; from the central part of the apparatus there arises a short metal rod, which is brought into contact with the recording plate. A tracing thus obtained shows a line of ascent, a vertex, and a line of descent. The line of ascent is almost vertical, and the vertex slightly rounded. The line of descent presents various undulations, one of these especially being quite pronounced. The wave may be said to be *dicrotic*. The author asserts that marked modifications of this tracing are produced in different pathological conditions, and that, therefore, great importance should be attached to the new sign.

One of the most interesting papers in this section of General Medicine was that of Professor Juan de Dios Carrasquilla, the noted physician of Bogotá, Colombia, S. A. It was entitled "A New Serotherapic Process in the Treatment of Greek Leprosy." Dr. Carrasquilla has devoted special attention to the subject for several years, and his work in this line has become classical in South American medicine. He is declared to be the first medical investigator to prepare and employ the anti-leprous serum on this continent.

From the rather lengthy paper of Dr. Carrasquilla the following extract regarding the technique of the new process is made. 1. The leprous patient is bled and the serum separated from the blood. 2. The serum of the leper is injected into a horse. 3. The horse so prepared is afterwards bled and the serum separated from the blood. 4. Patients are then treated with hypodermatic injections of the horse serum. 5. A horse is injected with 30 cubic centimetres of human serum three times at intervals of ten days. He is then bled ten days after the last injection, and again injected after the bleeding. He is bled twenty or thirty days after, and so on successively. 6. The patient receives a hypodermatic injection, of one to five cubic centimetres every third day, or at longer intervals if any reaction should set in. 7. The injection produces a normal reaction —chills, fever, perspiration, accidental myalgias, neuralgias, cutaneous eruptions, vertigo, etc. 8. The lesions which are characteristic of the disease are at the same time modified; the tubercles are smoothed down, as it were, and finally disappear by absorption, suppuration, or scaling; the spots lose their color or disappear entirely; the ulcers are healed up; sensibility becomes normal, and the general condition of the patient is greatly improved. 9. No medicine is administered to combat the reactions pro-

duced by the serum, except lemonade or other refreshing drinks to subdue the intense thirst. 10. The body is every day bathed with warm water containing a solution of permanganate of potassium, soda, or lime, from one-tenth to two-tenths per cent. The ulcerations are dressed with the same solution, and covered afterwards with aseptic cotton. 11. No special diet is required. 12. When the pulse is accelerated or the bodily temperature is above normal, no injection of the anti-leprous serum should be made. 13. The horny ulcers of the foot are treated with salicylic acid and collodion, those of the nasal and pharyngeal mucous membranes with solutions of borate of sodium, and the conjunctivitis with weak solutions of sulphate of copper.

In closing my remarks on the work of this Section, I may be permitted to devote a few words to the elaborate exhibition of specimens made by the Museum of Pathological Anatomy. This museum has recently been established in connection with the National School of Medicine, mainly through the efforts of Professor Rafael Lavista. Like the medical school, the museum is under the protection of the national government. It already possesses a very handsome collection of pathological specimens, particularly of native origin, to judge from the ones placed on exhibition. The museum is really a pathological institute. It is divided into three sections—Pathological Anatomy, Bacteriology, and Biological Chemistry. The work done is clearly expressed by the title of each section, but the object of all three is to carry on careful post-mortem investigations and foster original research. In the section of Pathological Anatomy there are three subsections—one devoted exclusively to experimental pathology, another to bacteriology, and the third to serotherapy. In biological chemistry there is also a separate sub-section for clinical microscopy.

The appearance of the specimens on exhibition was so markedly excellent, so natural, even as to their color, in many of which this had seemingly not changed at all, that inquiry was made as to the nature of the liquids employed in their preservation. I was informed that preference was given to the solutions proposed by Leprieur, with or without glycerin. The solution or liquid most commonly employed consists of: arsenious acid, 20 parts; phenol, 25 parts; sodium acetate, 10 parts; glycerin, 10 parts, and water, 85 parts. For light, thin specimens, such as intestines, the amount of phenol in the solution should be diminished, or substituted entirely by a small quantity of naphthol. There is being tried at present a solution of formaldehyde, which so far has produced satisfactory results.

Inquiring further as to the frequency of the various pathological changes observed in the City of Mexico, I was informed that tuberculosis is much more frequent than is generally supposed; that trichinosis and cysticercus of the brain are also quite common; that larvated forms of nephritis are likewise of frequent occurrence, as well as ulcerative diseases of the intestines, and that these, although serious in their nature, do not

belong to any of the classical types. The existence of amebæ in abscess of the liver has been proved time and again; manifold infections due to the *Bacterium coli* are frequently noticed, as well as the existence of a large variety of intestinal parasites, etc.

Section on General Surgery, Etc.

Quite a large number of very excellent papers were read before this section by various authors. It would be impossible for me to give abstracts of all these memoirs. Suffice it to say that, with rare exceptions, they gave origin to interesting and highly instructive discussions.

Dr. George N. Lowe, of Kansas, presented a work entitled "Cerebral Tumors and Abscesses, their Pathology, Symptomatology, Diagnosis, and Surgical Treatment." He maintained that, with reference to benign growths, after complete extirpation or enucleation there is but a slight probability of their recrudescence. He further affirmed that in dealing with malignant tumors we may expect a recrudescence of the growth in some region of the body unless there be a complete extirpation of the parts affected, while the growth is in its embryonic or incipient state; that, although our present knowledge of topographical anatomy and cerebral localization is not altogether correct, yet it is sufficiently accurate to enable us in the large majority of cases to approximate the region or regions of the brain in which the lesion or lesions are situated.

There is no necessity of my giving an abstract of the able article of Dr. Carl Beck, of New York City, on "The Röntgen Rays in Surgery," as the paper has already appeared in full in the May number of the International Medical Magazine.

A paper on "Intestinal Obstruction" was read by Dr. George W. Woods, of California. The author maintained that, with proper antiseptic precautions and a perfect operative technique, there is very little or no danger in the practice of exploratory celiotomies.

Dr. J. Frank, of Chicago, read an exhaustive memoir on "Intestinal Anastomosis," which created a great deal of interest. Before reading his paper, Dr. Frank was given an opportunity at one of the hospitals to illustrate his own method by actual experimentation on a dog. The divided ends of the resected intestine were united by means of a bone button, this being connected with a piece of rubber drainage-tube. The animal was sacrificed before the expiration of forty-eight hours, and careful examination showed that union by anastomosis had already begun to take place. The complete success of the operation gave origin to a spirited discussion of Dr. Frank's paper, in which Drs. Lavista, Macias, Contreras, and other noted Mexican and foreign surgeons took part.

In an able paper on "Tuberculosis of the Knee," Dr. Angel Contreras, of Puebla, Mexico, advocated atypical arthrotomy, as being preferable to revulsion, immobilization, and typical resection, as well as to antiseptic and other injections.

"Varix of the Lower Extremity: Its Causes, Pathology, Symptomatology, and Treatment," was the title of a paper by Dr. Thomas H. Manley, of New York. The author said that the treatment of varicose veins, of some of the conditions leading to them, and of their complications should be constitutional and local, prophylactic, palliative, or radical. It should be remembered that in their evolution and development they are not altogether unlike hernia; they are displaced viscera, the harm resulting as much from their encroachment on neighboring structures as from the changes in their own integral parts. Unhappily, in most cases we must be content with only temporary measures. The vessels need support by bandage or other means. It is only in aggravated cases that surgical interference should be invoked, although there is no lesion more satisfactory to treat than this, through operative means. In fact, with proper precautions there is no danger, and probable cure can be promised in nearly all properly selected cases.

Dr. Robert J. Wilding, of New York, had a paper on the "Treatment of Stricture of the Urethra by Continuous Elastic Dilatation." He said that the principle involved in the treatment referred to, consists in taking advantage of the fact that continuous elastic pressure tends to produce absorption of such tissues as are subjected to its action. This applies to the enlargements resulting from inflammatory processes, as well as to normal tissues. Continuous elastic pressure also quickly relieves spasmodic or nervous contractions, apparently by tiring out the living tissues. As far as is known to the author, this method has not been previously brought to the notice of the profession. Its execution is simple, and, being carried out almost entirely by the use of elastic soft rubber instruments, which are carefully disinfected, is not likely to cause abrasions, and so almost entirely does away with the danger of septic infection. The stricture is dilated by passing through it a soft rubber catheter a few sizes larger than the calibre of the stricture, and leaving it *in situ* until it plays freely therein, when another of a larger size takes its place. This process is repeated until the desired result is obtained. The average time each instrument has to remain in the urethra is from twenty-four to forty-eight hours. The catheters are passed by being stretched on flexible guides so that they become small enough to pass through the stricture.

From his paper on "Some Points in the Surgical Treatment of Epilepsy," Dr. Edmund J. A. Rogers, of Denver, Colorado, drew the following conclusions: 1. Surgical relief should be attempted in cases of partial or Jacksonian epilepsy, although externally the skull presents no evidence of disease. 2. The sooner surgical interference is undertaken after the occurrence of the initial spasm in all operable cases, the greater the probabilities of relief. 3. In a case of epilepsy attended with depression of the skull the depressed bone should be removed regardless of the character of the convulsions, provided the injury to the head antedated the

initial convulsion. 4. In all cases of partial or Jacksonian epilepsy the cortical centre for the first muscles concerned in the convulsion should be removed, even though the epileptic condition has existed only for a few months and the cortical centre presents no macroscopical evidence of disease. 5. Great care should be exercised in determining the exact seat and extent of a given centre, and its entire area should be removed. 6. The surgical treatment for convulsions due to infantile cerebral paralysis is usually unsatisfactory.

Dr. Miguel Otero, of San Luis Potosi, Mexico, read a paper on "The Future of Hypogastric Cystotomy; its Operative Technique and Subsequent Results." The author recommended to general practitioners the hypogastric method for all calculi, and was of the opinion that even surgeons should prefer it in cases where Bigelow's operation is not feasible.

Section on Obstetrics, Including Gynecology and Abdominal Surgery.

A number of valuable memoirs were presented in this Section. I will endeavor to give a synopsis of a few of them.

Dr. J. Ignacio Capetillo, of the City of Mexico, had a contribution on "Dystocia in Mexican Women." He divided dystocia into maternal, fetal, and ovular. The causes of maternal dystocia mostly arise from the bad direction of the axis of the uterus, from the vicious conformation of the vertebral column and of the promontory of the sacrum, or from the special conformation of the pelvis in Mexican women. The narrowed pelvis, properly so called, is *extremely rare*, and may be the result of rickets or, more frequently, of osteomalacia. Dystocia in the third period of labor is due to the shortness of the perineum and the smallness of the vulva in native Mexican women, as compared with those of women of European origin. This defect the author attributed to the habits of life pursued by the native females, since these women are accustomed to occupy for long periods of time a kneeling position while making use of the *metate* in grinding corn, wheat, and other cereals.

"The Treatment of Puerperal Infection" was the subject of a paper by Dr. Manuel Barreiro, chief of clinics in the Maternity Hospital of the City of Mexico. The practice followed in this hospital, from which the best results are obtained, consists in the administration to all puerperal cases of a mild purge on the day following delivery and of tepid vaginal injections on subsequent days. Should the temperature rise, an intrauterine injection is prescribed. If after the lapse of two days the temperature continues high, washings are administered frequently. If the temperature does not fall to normal by the third or fourth day, curettage must be resorted to. The objections which have been brought forward against this operation are, clinically speaking, of no value. Its advantages are indisputable, especially when the infection is due to fragments of

placenta, which, in the opinion of the author, are present in the majority of cases. The most convenient antiseptic is generally iodine, on account of its volatile nature and of its power thoroughly to penetrate the tissues. In many cases, however, better results are obtained with corrosive sublimate, permanganate of potassium, or oxygenated water. As a tonic, strychnine, hypodermically administered, is used with advantage. Should success not be obtained after the first curettage, this must be repeated a second or even a third time. The author believes that curettage, if done in time, is superior to any other means that we have at our command.

In his "Contribution to Abdominal Surgery," Dr. Alfonso Ortiz, of Sonora, Mexico, spoke most favorably of laparotomy. He was of the firm opinion that a simple abdominal incision benefits largely or cures radically many inflammatory processes of the peritoneum, just as a painful and irritable cystitis is cured by cystotomy, an iritis by iridectomy, an incipient glaucoma by von Graefe's classical method; in the same manner, in fact, that cerebral disease of epileptiform character is relieved by a trephining, and as very serious ear troubles disappear as if by magic after making a puncture of the tympanic membrane.

Dr. A. Vander Veer, of Albany, N. Y., read a very interesting paper on "Uterine Fibroids complicated with Pregnancy" and reported several cases. He maintained that some forms of fibroids, such as the subperitoneal, pedunculated, or sessile, often give but little trouble on the occurrence of pregnancy, but the chief danger exists in those cases in which the growth extends into the uterine cavity or obstructs the outlet of the pelvis. Myoectomy in the interest of the child, for cases in which dystocia would in all likelihood occur, offers a means of relief; near the close of the term when dystocia is imminent, suprapubic hysterectomy the author regards as the safest operation to undertake. In such cases it may be expected that the loss of the mothers will not exceed ten per cent., and the loss of children will be practically *nil*. He referred to the larger fibroids that are often liable to take on what is called cystic degeneration; in many of these cases the author would advise removal of the appendages in preference to resorting at a later date to a Cæsarean operation.

I cannot finish these imperfect "Notes" without referring to the excellent contribution of Dr. Augustus P. Clarke, of Cambridge, Massachusetts, entitled "Some Experiences in the Management and Surgical Treatment of Ectopic Pregnancy." In summarizing his paper, the author said that in those cases in which the fetal sac is situated in the abdominal cavity there will not usually be an immediate urgency for surgical interference. In those cases of the very earliest form of ectopic pregnancy the application of the galvanic or faradic current may be effective in overcoming the fetal life and thus enabling absorption of the remains to take place. The cases in which rupture has occurred and the child continues to develop should be treated as circumstances demand. If the fetation has

not gone beyond the third month, removal by celiotomy should be advised. When the pregnancy has passed beyond the sixth month it may, under proper cautions, be allowed to continue until the end of the eighth month. In those really desperate cases of rupture of the sac or of blood-vessels, prompt resort to celiotomy should be regarded as the chief reliance. The precaution should be adopted whether the hemorrhage is the result of a primary rupture or is a sequel to the yielding of a partially restored vascular tissue. The nearer the gestation has reached the close of its term, the greater will be the probability of saving the life of the child. The immediate removal of the placenta in such cases is often attended with extreme danger; for this reason the gestation sac should sometimes be sutured to the peritoneum, and the placental mass before its removal be allowed time to undergo contraction and become loosened from its attachment. If it is deemed wise to effect immediate removal of the placenta, it can best be done after clamping and tying the ovarian and uterine arteries; should the fetal sac then be found too firmly adherent to allow its safe removal, suturing its edges to the parietal peritoneum and the employment of drainage will be required. In those cases in which the fetation is intraparietal the liberation of the child can be more safely effected, so far as the mother is concerned, by resort to hysterectomy than by the adoption of other surgical procedures. In some cases closure of the rent by aseptic animal sutures and the stitching of the opening to the abdominal wound might prove sufficient for overcoming the hemorrhage. Cases that sometimes give rise to most alarming symptoms are those in which the fetation takes place in some portion of the Fallopian tube. Hemorrhage from the rupture of the sac or from the yielding of the vessels near the fimbriated extremity of the tube can best be controlled by suturing the ruptured vessels through an abdominal incision.

TREATMENT OF ACUTE PNEUMONIA.[1]

BY THOMAS J. MAYS, A.M., M.D.,

Professor of Diseases of the Chest in the Philadelphia Polyclinic; Visiting Physician to the Rush Hospital for Consumption in Philadelphia; etc.

During the last five years I have been engaged in making a collective investigation on the influence of cold applied to the chest in the treatment of acute pneumonia, and so far have succeeded in gathering two hundred and ninety-nine cases of this kind from the experience of my fellow practitioners and from my own. In studying and analyzing these cases I have naturally formed convictions and drawn conclusions concerning the utility of the treatment which was employed, and, although these may not be

[1] Read by invitation before the Hartford (Conn.) Medical Society, April 19, 1897.

entirely correct, I express the hope that they may be of sufficient practical interest to justify me in bringing them before you this evening for a free and full discussion.

In the first place, let us seriously consider the pathological condition with which we have to deal when we are confronted by a case of acute pneumonia, for over and above the picture which this gives us of the mechanism of the affection, it will also lead us to adopt correct principles of treatment. Under the term acute pneumonia I include both croupous and catarrhal varieties, though, as is well known, these two forms differ pathologically. In the croupous variety the pulmonary capillaries are enormously distended and engorged with blood. There is partial or complete stasis in these vessels, and the serum of the blood exudes through their walls and accumulates in and finally fills the air cells of a whole lobe, for which reason, as is well known, it is also called lobar pneumonia. The next step in the morbid process is a fatty decomposition and expectoration or absorption of this accumulated material, and after this the lungs return to perfect health. In the catarrhal form of acute pneumonia the process is different. The blood-vessels are also distended and engorged with blood, but in place of a serous exudation into the air cells, these become partially or completely filled with catarrhal material derived chiefly from their epithelium. The whole process seems to be less active than that in the croupous variety, but the morbid products may also undergo fatty degeneration, although there is danger of cheesy metamorphosis if the affection is too prolonged. Now, whatever may be the cause of the distention and engorgement of the pulmonary capillaries in both forms, and especially in the croupous variety, it is this *blood-fulness* of the lung which must be constantly borne in mind as one of the salient points in the treatment of this disease.

This leads to a consideration of the various tendencies towards death in pneumonia, and in doing this I shall first take up the inflammatory process in the lung itself. This being the most superficial manifestation of the disease, it is very often taken for granted that its area is an indication of the seriousness or insignificance of the affection. This holds true as a rule, but must not always be depended on, for occasionally cases are met with in which very few abnormal physical signs are discoverable, so far as infiltration is concerned, and yet the symptoms are of the gravest character and, therefore, out of all proportion to the size of the area which is implicated. On the other hand, cases are found in which several lobes are involved, while the symptoms are unusually mild, and the patients make a rapid recovery. A frank and limited localization of the inflammatory process in the lung is not one of the most unwelcome features of pneumonia, yet efforts must always be made towards allaying and circumventing it.

One of the most serious of these tendencies is respiratory failure, which seems to be dependent on an impaired and defective nerve supply of the lungs in particular, and on a profound depression of the nervous system in

general. It is a symptom which is frequently associated with latent, senile, and alcoholic pneumonia. As a rule, a low temperature is one of its characteristics. The respiration is short and frequent. There is a want of respiratory movement in the chest walls, and the abdominal breathing is exaggerated. Each breath is a labored one, and almost seems as though it were the last the patient could take. Such patients have assured me that they feel as if the only breathing surface left to them were centred in the upper and middle portion of the chest. Auscultation often reveals only a small amount of physical disintegration, and this generally at the base of the chest, although the respiratory murmur is markedly diminished in volume, if not over the whole chest, at least in spots. There is orthopnea, but cyanosis is not so marked as it is when the heart becomes much implicated. Another prominent symptom in this tendency is pain or distress in the epigastric region, which, in all probability, comes from the diaphragm, and is evidence that this organ, in endeavoring to establish compensation for the loss of pulmonary movement, is being overworked.

Another tendency towards death comes through paralysis of the heart. This is partly due to a want of cardiac innervation, and partly to obstruction of the pulmonary circulation. It is very readily seen that stasis of the blood in the lungs, such as is found in acute pneumonia, will at once interfere with the free flow of blood through the right side of the heart and lead to distention of the right ventricle. It becomes a question, therefore, of the greatest importance, whether this tendency is best overcome by stimulating the heart's action, or by removing the obstruction in the lungs, to which I shall revert further on.

The fourth tendency towards death, of which I shall speak, is fever with its consequences. According to Ott, Aronsohn and Sachs, Eulenberg, and Landois, fever is always evidence that the function of heat coördination is disordered and that it has lost its power of restraining excessive heat production, or heat dissipation, or both. The same observers have shown that this power of heat regulation resides in the six heat centres, two of which are in the cortex and four at the base of the brain, and that electric or mechanical irritation of these centres produces a temperature-rise lasting for hours. Fever is, therefore, essentially a neurosis, and one of its dangers lies in the well-known fact that it is a great tissue-waster. Besides this, fever also generates toxins in the body which, according to the experiments of Vincent, are capable of causing convulsions, stupor, and death in guinea-pigs, sparrows, and frogs.

Now, the therapeutic indications which may be drawn from the foregoing considerations are as follows: (1) *Reduction of the volume of blood in the lungs.* This relieves the distention of the pulmonary capillaries, checks the serous exudation and catarrhal infiltration, abates the stasis in the pulmonary blood-vessels, restores the cardio-pulmonic circulation, and relieves the strain on the right side of the heart. (2) *Reduction of fever.*

This allays the irritability of the nervous system, diminishes bodily waste, and lessens the danger of toxin formation in the blood. (3) *Support of the nervous system* in general, and the pulmonary nerve supply in particular. (4) *Support of the heart's function.* (5) *Nourishment of the patient.*

Now, what is the agent or agents that will meet most of these indications in the best possible way? I believe we possess this agent in ice, or ice-cold water applied in rubber bags locally to the chest and directly over the seat of inflammation; and this for the following physiological reasons: Cold contracts blood-vessels, reduces fever, stimulates the whole nervous system, and supports the action of the heart. Practically, as I have witnessed time and again, the ice will check extension of the inflammatory process, promote resolution, disperse the products of exudation, reduce the fever, diminish the cardiac and respiratory frequency, tone up the heart, strengthen the pulse, alleviate difficult breathing, abate pain in the chest, and give general comfort to the patient.

The number of ice-bags which are to be applied in any case depends on the degree of fever which is present, and on the size of the area which is inflamed. If the fever is not very high and the area is small, one or two will answer. If the fever is high and the involved area large, almost any number may be applied, always bearing in mind that the head should have one or two bags applied constantly. On one of the worst patients I had I applied nine, which covered the whole chest, sides and front, and two to the head. The length of time during which they are applied also depends somewhat on the range of fever. If the temperature falls near the normal then I think it is wise to remove some of the ice-bags, but think it is best not to remove them all, even though the temperature is down, unless the crisis is at hand, because if all the bags are removed before the proper time, the temperature will rise again, and is brought down with greater difficulty the second than the first time.

Supposing that in a very grave case cold had been applied after the manner here prescribed, and had failed to modify the difficult breathing, the distress in the chest, the cyanosis, etc., what could be done to reinforce the influence of cold? There is no question that the old and almost forgotten art of venesection will give more assistance than anything else in such an emergency, and should be resorted to without hesitation. Its effects under these conditions are the same as those which are sought to be brought about by cold—viz., relief to the over-distended cardio-pulmonary circulation.

What is to be said of the drug treatment in pneumonia? In the face of the present trend to regard pneumonia as a self-limited disease, and that hence all the practitioner has to do is to sit idly by and admire the storm while it is passing over, it is somewhat in a spirit of diffidence that one suggests the feasibility of the use of drugs or of anything else in this disease.

In spite of this opinion, however, I have a feeling, which is born of experience, that drugs are invaluable here, and that one of the best of these is *strychnine*. This drug, with its stimulating action on the nervous system in general and on the respiratory nerve supply in particular, is especially well adapted for use in this disease, as it is in fact in all diseases of the pulmonary organs. Over and above this it is the equal of digitalis in enhancing the function of the heart, and in this manner tends to overcome some of the most serious tendencies to death in this disease. To get the best action of strychnine it must be given for tangible effects, *i. e.*, in doses large enough to approach the line of its toxic action, and for this reason it is useless when given in small doses. In the adult it is best to begin with a dose of $\frac{1}{30}$ of a grain four times a day, and reinforce this with a hypodermic dose of $\frac{1}{20}$ of a grain morning and evening. This amount can be increased, and very liberally, too, if the case is one of alcoholic or latent pneumonia. Another valuable drug is *digitalis*. With the very large doses of this agent which are prescribed by some authorities I have had no experience, but always give it in dessertspoonful doses of the infusion or from ten to fifteen drops of the tincture every four hours, with a view of obtaining its tonic influence on the heart-muscle. *Capsicum* is also of great utility. It is one of our most effective diffusible stimulants, and is of especial advantage in that stage of pneumonia which is characterized by a low muttering delirium, comatose tendency, picking at the bedclothes, etc., and which is very frequently associated with a dry and sometimes black crusty tongue. It is to be given in doses of from ten drops to a teaspoonful of the tincture in water every three or four hours. I have given a teaspoonful of tincture of capsicum every hour with the best results in cases of low alcoholic pneumonia. *Morphine* given hypodermically at night in quarter-grain doses will secure sleep and add to the comfort of the patient. Sleep is very important in this disease, and a ten-grain suppository of *asafetida* at bedtime will materially aid the hypnotic effects of morphine. *Oxygen* given by inhalation is of immense service in cases of great dyspnea and cyanosis. Of course, it is only of temporary use, but during that time it assists greatly in bridging over the most critical period of the disease, and so saves the patient's life. If the dyspnea is marked it must be given more or less constantly. The *salicylate of cinchonidia* and the *salicylate of soda* are especially useful in the treatment of pleuro-pneumonia, or in grip-pneumonia, or when the pneumonia is complicated with painful joints, or if the disease occurs in a patient with a rheumatic history. Whenever these manifestations occur it will always be of advantage not to overlook these most important agents.

The question of food also concerns us greatly in the management of this disease. The food should be of the most nourishing character, concentrated in bulk, and of easy digestion. Such food we find in freshly expressed beef juice, of which two ounces, properly seasoned, should be

given alternately, every two hours, with a glass of milk containing a tablespoonful of whiskey or brandy. If the stomach is rebellious the beef juice and milk and whiskey may be given by the rectum.

Now a few words more in regard to the ice-cold treatment of pneumonia. If it were not for the belief which I entertain, that it offers the fairest hope for solving the problem how to treat pneumonia most successfully, I would not be before you with this topic to-night. I do not offer this measure as a panacea, but I have the conviction that the treatment of pneumonia as ordinarily carried out, or exclusively of cold applied in some form, is worse than useless. I must confess that this is strong language to use, but when we look about and see that the natural tendency to recovery in this disease holds good in about eighty-five out of every hundred cases, and then find that our hospital statistics, with a few exceptions, give us a death-rate ranging from fifteen to thirty per cent., I think I am perhaps justified in employing it. I think this view is also endorsed by the results obtained in the cases which comprise my collection. Thus, in the 299 cases so far gathered there were ten deaths, giving a total death-rate of 3.35 per cent. Over and above the superior results which are given by the ice treatment in these cases is the fact that they were not secured by a single individual only, but by as many as fifty independent observers, among whom are a number who have treated a score of cases without a single death. This of itself speaks volumes in favor of the treatment, for it shows that the personal equation of the practitioners cannot enter very largely into the question of its success.

Now, what of the future of the treatment of acute pneumonia? Is there reason for believing that the death-rate of this disease may be diminished still further on the lines here indicated? I believe that this is possible. Of several things I am certain. One of these is that we have the course of pneumonia under control. The other is that the idea that pneumonia is a self-limited disease and pursues the even tenor of its way in spite of all medication is a delusion and a myth of the most pernicious type. It is a sprag in the wheel of therapeutic advancement. It is on a par with and belongs to the dogmatism of twenty-five years ago which asserted that the whole treatment of acute rheumatism could be summed up in "three weeks and plenty of woollen blankets." Salicine and the salicylates have undeceived us and taught us better. Thanks to them, this disease consumes a less number of hours now than it did days then, and we approach it with the utmost confidence, but not with any greater degree of assurance than, I believe, we may encounter acute pneumonia at the present day.

SIMPLE MYOSITIS AS AN OCCUPATION DISORDER.

BY HAROLD N. MOYER, M.D.,
Chicago, Ill.

THE pathology of the neural disorders of writers and artisans is still in a vague state. In many cases it is thought to be an inflammation of the peripheral nerve, and in some instances structural changes have been noted in the nerve trunks. In others a most careful search does not reveal any appreciable organic change. We are not aware that changes have been noted in the nerve centres. It is possible that the muscles or the peripheral ending of the motor nerve at the ultimate muscular fibril are themselves involved. The correct understanding of these occupation neuroses consists in regarding the peripheral neuron as a single structure, which includes the motor cell in the anterior horn, the nerve trunk, and its peripheral ending. Disease may begin at any of these points, and, if it does, the result will be more or less disturbance of the whole structure.

The following case illustrates a condition that I regard as very exceptional in the occupation neuroses: S. C., 41 years of age, by occupation a wood-carver, presented himself at the clinic for nervous diseases, Rush Medical College, February 24, last. The previous health history of the patient was excellent. Nine months before coming under observation he noticed a painful condition located on the outer side of the elbow-joint of the right arm. It gradually became worse, and soon a swelling was observed; there was, however, no redness of the skin. A few days' rest would serve to reduce the swelling, but a return to his occupation within a few hours brought the pain back, and at the end of a day or two it was necessary to cease work. During all this time his general health remained good. He says that he has always been free from rheumatism, and has never suffered from any painful affection with the exception of the one in question. He has been treated for rheumatism, but without benefit; local applications and counter-irritants have also proved inefficient.

Examination of the arm shows a swelling of the muscles extending downward from the external condyle of the humerus about two and one-half inches. The enlargement is confined to the muscles which have their origin at the external condyle, those more especially involved being the supinator longus, extensor carpi radialis longior, and brevior. The muscular bellies are firm, and on deep pressure there is some pain. Over the inflamed muscles the skin is not changed, nor is there any edema of the subcutaneous tissues. Sensation throughout the extremity is perfect, and no tender points can be found along the nerves. The electrical reactions of the affected muscles seem to be normal. The faradic current gives a sharp, quick contraction, similar in all respects to that found upon

the left or healthy side. With the galvanic current the cathodal contraction precedes the anodal in both muscle and nerve.

The patient states that if he stops work the swelling gradually subsides and pain ceases. If, however, his occupation is resumed, in a few hours the pain returns, and gradually increases in severity until he can no longer continue. He is positive that at no time are there any spasms in the affected muscles. There is no incoördination or spasmodic movement of the fingers while employed. Indeed, he observes no decrease in his ability as a wood-carver, but is only compelled to give up his occupation because of the pain. The use of the arm in other employment than wood-carving does not aggravate the condition.

That this is an occupation disease, though decidedly exceptional in its manifestations, I have no doubt. The fact that it is associated with the use of particular groups of muscles, corresponding with those involved in the inflammation, is sufficient to fix the nature of the disorder. The patient illustrated the usual movements in wood-carving, and this showed the predominating use of the supinators and extensors which have their origin at and below the external condyle. The close relation of the disorder to his occupation is evidenced by the exacerbations always noted after employment, by the fact that it was not associated with rheumatism or other constitutional taint, and that general remedies proved of no service in the treatment of the affection.

THE CONDITION OF THE BLOOD IN THE CACHEXIA OF CARCINOMA.

FROM THE PEPPER LABORATORY OF CLINICAL MEDICINE, NO. 9.

BY JOS. SAILER, M.D., AND A. E. TAYLOR, M.D.,

Associates in Clinical Medicine, Pepper Laboratory of Clinical Medicine, University of Pennsylvania.

In patients afflicted with cancer the more or less definite signs of the disease are generally dependent upon the locality of the neoplasm and the extent of its growth. However, cases in which no localizing signs are to be elicited are not rare, and it is in such cases as these that the study of the blood becomes of great importance. We have been enabled to study the blood of 22 cases of advanced cancer of various viscera; the diagnosis of these cases was confirmed either by necropsy or by histological examination *in vivo*, or was so obvious that all doubt was excluded. Only the hemoglobin and the morphology of the blood could be studied. As venesection or venepuncture could rarely be performed, it was impossible to estimate the alkalinity and specific gravity of all the cases or to make chemical

studies of the fibrin, sugar, salts, etc. For the material we are indebted to the kindness of Drs. Pepper, Stengel, Musser, White, Burr, Penrose, and Hand.

Case I.—Carcinoma of the stomach, with secondary nodules in the liver, lungs, kidney, and heart-wall, in a woman of 45 years.

Hemoglobin, 22 % ; red cells, 1,900,000 ; leucocytes, 22,000. There was considerable poikilocytosis, a few nucleated erythrocytes, all normoblasts.

Differential Count of Leucocytes.—Neutrophilic polynuclear, 76 % ; oxyphilic polynuclear, 1 % ; mononuclear and transitional, 20 % ; lymphocytes, 3 %. No myelocytes could be found.

Post mortem the bone marrow was that of a normal adult, the spleen and lymph glands were normal excepting for fibrous overgrowth, and there was no excess of iron in any of the organs.

Case II.—Carcinoma of very rapid growth in the stomach of a man of 50, with a large tumor in the gastric area ; symptoms positive. Cancer of pylorus, liver, and lymphatic glands was revealed by laparotomy done to form a gastro-intestinal anastomosis.

Hemoglobin, 30 % ; red cells, 2,812,000 ; leucocytes, 10,400. Cells were regular but pale, and none were nucleated.

Differential Count.—Neutrophilic polynuclear, 67.2 % ; oxyphilic polynuclear, 4.6 % ; mononuclear and transitional, 23.8 % ; myelocytes, 1.0 % ; oxyphilic mononuclear, 0.4 % ; lymphocytes, 3.0 %.

Case III.—Man of 45 years, who died with signs and symptoms of pernicious anemia. A very small cancer, in no way proportionate to the symptoms, was discovered post mortem in the posterior wall of the stomach, with secondary growths in the head of the pancreas and in the retroperitoneal lymph glands.

Hemoglobin, 20 % ; red cells, 1,100,000 ; leucocytes, 45,000 ; poikilocytes were present in moderation. There were some nucleated red cells, a few in nuclear division, which were all normoblasts.

Differential Count.—Neutrophilic polynuclear, 43.7 % ; oxyphilic polynuclear, 1.0 % ; mononuclear and transitional, 21.0 % ; myelocytes, 9.3 % ; lymphocytes, 25.0 %.

The marrow was less fatty than normal, and was lymphoid, only, however, in a few areas to a very slight degree. The spleen and lymph glands were fibrous, the liver and kidneys somewhat fatty, and there was no excess of iron in any of the organs. While the symptoms were out of all proportion to the neoplasm, the morbid lesions of pernicious anemia were absent.

Case IV.—Carcinoma of the stomach, with interestitial nephritis, in a man of 47 years. Laparotomy for gastro-intestinal anastomosis showed cancer of pylorus, liver, and retroperitoneal glands.

Hemoglobin, 68 % ; red cells, 4,200,000 ; leucocytes, 3000; poikilocytosis was slight, and there were no nucleated red cells.

Differential Count.—Neutrophilic polynuclear, 88.7 % ; oxyphilic polynuclear, 2.5 % : mononuclear and transitional, 5.0 % ; lymphocytes, 3.8 %. This count is entirely normal, except for the low proportion of lymphocytes, and in this man the symptoms were mild.

Case V.—Carcinoma of the stomach in a man of 60 years. Laparotomy for gastro-intestinal anastomosis showed cancer of the posterior wall of the stomach and in the liver.

Hemoglobin, 55 % ; red cells, 4,000,000 ; leucocytes, 10,000 ; poikilocytosis was moderate, and there were no nucleated red cells.

Differential Count.—Neutrophilic polynuclear, 66.5 % ; oxyphilic polynuclear, 1.6 % ; mononuclear and transitional, 14.0 % ; oxyphilic mononuclear, 0.2 % ;

basophilic mononuclear, 0.2 %; neutrophilic transitional, 0.2 %; lymphocytes, 17.2 %. The neutrophilic transitional leucocytes were like the ordinary polynuclear cells in all respects except that the nucleus was large, and faintly and diffusely stained, and thus quite resembled some of the polymorphous leucocytes in the newborn.

Case VI.—Carcinoma of the rectum in a man of 50 years, sections of which showed squamous carcinoma.

Hemoglobin, 25 %; red cells, 2,400,000; leucocytes, 4,000. There was a marked poikilocytosis of the red cells, which were very pale. There were many nucleated red cells of all kinds, microblasts, normoblasts, and gigantoblasts, and some free nuclei. Typical karyokinetic figures were seen in four large mononuclear leucocytes, and some of the nuclei of this type of leucocytes were fragmented.

Differential Count.—Neutrophilic polynuclear, 48.0 %; oxyphilic polynuclear, 0.8 %; mononuclear and transitional, 38.6 %; myelocytes, 0.2 %; lymphocytes, 12.6 %.

Case VII.—Carcinoma of the stomach, with secondary growths in the glands and omentum.

Hemoglobin, 46 %; red cells, 3,600,000; leucocytes, 12,000. There was some poikilocytosis, but no nucleated red cells.

Differential Count.—Neutrophilic polynuclear, 76.5 %; oxyphilic polynuclear, 1.0 %; mononuclear and transitional, 12.5 %; lymphocytes, 10 %.

Case VIII.—Carcinoma of the rectum in a man 60 years of age.

Hemoglobin, 38 %; red cells, 4,000,000; leucocytes, 6,000. There was considerable poikilocytosis, and some nucleated red cells.

Differential Count.—Neutrophilic polynuclear, 70.0 %; oxyphilic polynuclear, 1.0 %; basophilic polynuclear, 0.2 %; mononuclear and transitional, 15.7 %; lymphocytes, 13.0 %.

Case IX.—Carcinoma uteri; confirmed by sections after a later operation.

Hemoglobin, 30 %; red cells, 3,600,000; leucocytes, 10,000. Some poikilocytosis was present, the cells were very pale, and there were a couple of nucleated red cells and quite a number of loose fragmented nuclei of leucocytes.

Differential Count.—Neutrophilic polynuclear, 76.2 %; oxyphilic polynuclear, 0.6 %; mononuclear and transitional, 9.8 %; lymphocytes, 13.4 %. Some of the mononuclear cells are very large and have huge nuclei (10 x 12 μ), but the protoplasm is entirely homogeneous.

Case X.—Carcinoma situated near the cardiac end of the posterior wall of the stomach in a man of 48 years. Death consequent upon hemorrhage.

Hemoglobin, 25 %; red cells, 2,000,000; leucocytes, 10,400. There were no nucleated red cells, but little poikilocytosis, many shadow-cells, no fragmented nuclei, and no karyokinetic figures.

Differential Count.—Neutrophilic polynuclear cells, 66.4 %; oxyphilic polynuclear, 0.4 %; mononuclear and transitional, 8.8 %; lymphocytes, 24.4 %.

Case XI.—Carcinoma uteri in a woman 54 years of age.

Hemoglobin, 23 %; red cells, 1,856,125; leucocytes, 18,750. There were no nucleated red cells.

Differential Count.—Neutrophilic polynuclear, 76.5 %; oxyphilic polynuclear, 1 %; mononuclear and transitional, 12.5 %; lymphocytes, 10 %.

Case XII.—Carcinoma of the uterus and vagina in a woman of 70 years. Extreme cachexia.

Hemoglobin, 25 %; red cells, 13,000; leucocytes, 25,000. There were no nucleated red cells.

Differential Count.—Neutrophilic polynuclear, 58.2 %; oxyphilic polynuclear, 1.4 %; mononuclear and transitional, 16.4 %; lymphocytes, 24.0 %.

Case XIII.—Carcinoma of the omentum in a woman of 54 years. Extreme cachexia.

Hemoglobin, 30 %; red cells, 3,387,500; leucocytes, 18,600. No nucleated red cells were present.

Differential Count.—Neutrophilic polynuclear, 79.8 %; oxyphilic polynuclear, 10.4 %; mononuclear and transitional, 14.7 %; lymphocytes, 5.3 %.

Case XIV.—Cancer of the breast in a woman 60 years of age.

Hemoglobin estimation and corpuscular count were lost. There was moderate poikilocytosis, but no nucleated red cells.

Differential Count.—Neutrophilic polynuclear, 54 %; oxyphilic polynuclear, 2.8 %; mononuclear and transitional, 40 %; lymphocytes, 3.4 %.

Case XV.—Carcinoma of the scalp in a woman of 63 years.

Red cells, 3,900,000; leucocytes, 10,500. Poikilocytosis was present in moderation, but there were no nucleated red cells.

Differential Count.—Neutrophilic polynuclear, 66.3 %; oxyphilic polynuclear, 0.2 %; mononuclear and transitional, 28.8 %; lymphocytes, 4.8 %.

Case XVI.—Carcinoma of the left arm in a woman, amputation of which was followed by recurrences of cancer. Extreme cachexia.

Red cells, 4,385,000; leucocytes, 8,000. Poikilocytosis was marked. There were no nucleated red cells.

Differential Count.—Neutrophilic polynuclear, 61 %; oxyphilic polynuclear, 1 %; mononuclear and transitional, 35 %; lymphocytes, 3 %. This case illustrates the fact that the appearance of extreme cachexia does not necessarily imply extreme anemia.

Case XVII.—Carcinoma of the breast in a female of 53 years.

Red cells, 2,700,000; leucocytes, 9,000. There was moderate poikilocytosis, and no nucleated red cells.

Differential Count.—Neutrophilic polynuclear, 61.2 %; mononuclear and transitional, 34.8 %; lymphocytes, 4 %.

Case XVIII.—Cancer of face, involving the bones, in a man 58 years of age.

Red cells, 3,025,000; leucocytes, 6000; poikilocytosis was very marked, and there were many normoblasts.

Differential Count.—Neutrophilic polynuclear, 71.4 %; oxyphilic polynuclear, 0.4 %; mononuclear and transitional, 27.2 %; typical myelocytes, 1 %; lymphocytes, 10 %.

Case XIX.—Cancer of the colon in a male of 67 years, who had undergone colotomy. He has marked cachexia.

Hemoglobin, 28 %; red cells, 1,471,800; leucocytes, 14,800. There were moderate poikilocytosis and many normoblasts.

Differential Count.—Neutrophilic polynuclear, 66.2 %; oxyphilic polynuclear, 2.5 %; mononuclear and transitional, 27.9 %; lymphocytes, 4.4 %.

Case XX.—In a woman 51 years of age, cancer of the uterus, in which the pelvis was markedly involved; confirmed by autopsy.

Hemoglobin, 37 %; red cells, 2,190,000; leucocytes, 14,000; poikilocytosis was marked and there were a few normoblasts.

Differential Count.—Neutrophilic polynuclear, 70.5 %; oxyphilic polynuclear, 2.5 %; mononuclear and transitional, 12.5 %; oxyphilic mononuclear, 0.5 %; lymphocytes, 14 %. Four myelocytes were noted.

Case XXI.—Carcinoma mammæ, with marked chest involvement, in a woman of 45 years.

Hemoglobin, 48 %; red cells, 3,470,000; leucocytes, 14,600. There was marked poikilocytosis, but no nucleated red cells.

Differential Count.—Neutrophilic polynuclear, 68 %; oxyphilic polynuclear, 0.4 %; mononuclear and transitional, 18.5 %; lymphocytes, 13 %.

Case XXII.—In a man aged 47 years, neoplasm in the right iliac fossa and in the liver; autopsy demonstrated cancer of the stomach and liver.

Hemoglobin, 37 %; red cells, 3,260,000; white, 27,840; poikilocytosis was present in moderation; the cells were quite pale and two were nucleated.

Differential Count.—Neutrophilic polynuclear, 65.6 %; oxyphilic polynuclear, 0.4 %; mononuclear and transitional, 27.3 %; lymphocytes, 6.7 %.

The average of hemoglobin was 35 %, the extremes being 20 % and 68 %, which is, however, the one estimation over 60 %. Between 50 and 60 % there was one, between 40 and 50 % there were two, between 30 and 40 % six, and between 20 and 30 % seven estimations. These figures, which were made with all precautions upon the Fleischl instruments, are much lower than the 45 to 65 % estimation generally given (Laker,[1] Bierfreund,[2] Rienbach,[3] Rieder,[4] Cabot;[5] Haberlein[6] found a very low color index in gastric cancers). The cases were all advanced, but in only two instances was the anemia exaggerated by hemorrhage (Cases X. and XX., with 25 and 37 % respectively). On examination the cases in the literature seem to divide themselves into three classes: a pseudo-chlorosis, of which we have not a good example in our list; or the blood may be quite normal or not markedly below normal, as in Cases IV. and XVI.; or, what is the most constant, moderate oligocythemia with more marked oligochromemia. The error with the Fleischl instrument is fully 10 %, which, however, appertains to the figures quoted as well as to our own. We believe that our error has been minimized by our having used several pipettes in the estimations; *e. g.*, when a preliminary estimation revealed a proportion of about 30 %, three pipettes would be used in order to bring the reading up as near as possible to 100, in which case the error is obviously much less.

The average number of red cells was 3,085,000, again rather lower than figures hitherto reported. Four cases were at or above 4,000,000; between 3,500,000 and 4,000,000 there were three; between 3,000,000 and 3,500,000, four; between 2,500,000 and 3,000,000, two; between 2,000,000 and 2,500,000, three; between 1,500,000 and 2,000,000, two; and between 1,100,000 and 1,500,000, three. The cells of normal shape were nearly always of normal size; apart from microcytes and macrocytes; we have not been able to determine any variation in the size of the cells in general. Their color varied with the hemoglobin; undeniable evidences of degeneration were never found. Microcytes and macrocytes were seen in varying proportions in nearly all cases, usually in limited numbers. As a rule the macrocytes were disproportionately pale. Poikilocytosis was very variable: in several cases it was as extreme as we have ever seen it in true pernicious anemia, while in other cases it was very slight. Nucleated red cells were seen in ten cases, in two in large numbers

(VI. and XVIII.); in VI. there were microblasts and typical gigantoblasts. The total study of the red cells has not fully convinced us of the entire truth of the assertion of Strauer[7] that greater poikilocytosis is seen in cancer than is ever seen in tuberculosis. Polychromatophilia (which is not difficult to produce by fixing and staining manipulation) was rarely observed. The occurrence of nucleated red cells certainly does not indicate bone metastasis. According to Loos[8] there is in infantile hereditary syphilis a peculiar polychromatophilia not seen in cases of cancer or tuberculosis.

Leucocytosis was seen in the majority (15) of our cases; it was doubtful in two (8000 and 9000) and entirely absent in four (3000, 4000, 6000, and 6000). The average in the cases of leucocytosis was 18,000. Leucocytosis in this condition is an old fact, having been pointed out in post-mortem blood by Andral[9] and in living blood by Lücke,[10] previous to which pathologists believed the excess of the colorless cells to have been the cancer cells in circulation, an error to which Paget[11] clung as late as 1870. It was well studied by Virchow. It has been found in the majority of cases studied by nearly all authors (Hayem,[12] Alexander,[13] Pee,[14] Schneider,[15] Rieder,[4] etc.), with the exception of cases of cancer of the esophagus with starvation, and of cases of superficial cancer, as on the skin of the face, the extremities, or the penis. Nor does it appear that the variety of carcinoma or the rapidity of growth has a constant influence, although metastasis quite generally heightens leucocytosis. Hemorrhage, as a rule, increases it. Apart from all these considerations, there are quite a number of cases which have no leucocytosis or have it inconstantly. Of our series, IV. (3000) had cancer of stomach with nephritis and moderate cachexia; VI. (4000) had cancer of the rectum (without obstruction), with marked cachexia; VIII. (6000), cancer of the rectum with some obstruction and moderate cachexia; XVI. (8000), thoracic recurrence following amputation of the arm, with marked cachexia; XVII. (9000), cancer of the breast, with moderate cachexia, and XVIII. (6000), cancer of the face and bones and moderate cachexia. In the cases of leucocytosis the highest, 45,000, 27,800, 25,000, and 22,000, were respectively in cases of cancer of stomach without metastasis, of abdomen and liver, of uterus and vagina with marked local extension, and of stomach with marked metastasis. From our cases, therefore, few conclusions upon this point can be drawn. The differential counts are very interesting. They show in general an increase in the non-granulated mononuclear and transitional varieties at the expense mainly of the lymphocytes. The average for the cases with leucocytosis was: neutrophilic polynuclear cells 66.1 %, oxyphilic 1.5 %, mononuclear and transitional 19.3 %, lymphocytes 11.3 %. The excess of the mononuclear and transitional forms over the lymphocytes is in striking contrast to normal blood. In only five of these cases were the lymphocytes in excess of the large mononuclear forms, and these cases are entirely overshadowed

by the proportions in the remainder, of which seven showed less than 7 % of lymphocytes. The same results hold more strikingly for the cases without leucocytosis, where the averages were: neutrophilic polynuclear 65.3 %, oxyphilic polynuclear 0.9 %, mononuclear and transitional 26 %, and lymphocytes 7.6 %. In not one of these cases were the lymphocytes equal in number to the large mononuclear cells. We have differentiated the lymphocytes from the mononuclear and transitional cells by the distinct difference in the appearance and staining of the nuclear chromatin, and by the relative proportions of nucleus and protoplasm. Our results are contradictory to the figures given by Reinbach[3] and Cabot.[5] The neutrophilic granulations in the polymorphous cells were less numerous than usually seen in the same variety of cells in septic leucocytosis. The oxyphilic cells were abnormally low, but that is a very common condition. Myelocytes were found in four cases; their presence in cachectic and infectious conditions has often been shown. We were not able to confirm the suggestion of Epstein[16] that the coexistence of myelocytes and nucleated red cells means bone metastasis. Basophilic granulations were seen in two cases, and were of the fine variety. Amphoteric granulations were never seen. Rare changes in a few nuclei were observed in several cases, corresponding to the degenerations so well described by Gumprecht.[17] True karyokinetic figures were seen in one case, in large mononuclear cells. *Divisio per granulis* we were not able to demonstrate, but fragmented nuclei were often noted, as were free nuclei.

Müller[18] and Schneyer[19] believe that digestion-leucocytosis is absent in patients with carcinoma ventriculi. Hartung[20] found the same results; he also states that the injection of a nuclein-like substance obtained from the digestion of calves' spleens produces no reaction of leucocytosis in cancerous subjects, whereas the reaction follows such injections into non-cancerous subjects. We have not been able to study this question. Hausmann[21] and Capps[22] have observed digestion-leucocytosis in cases of gastric cancer, while on the contrary we have noted an entire absence of digestion-leucocytosis in a case of tubercular cachexia and in two cases of infectious leucocytosis. Before a definite conclusion can be reached it must first be determined whether and to what extent a proteid meal produces a further increase in the leucocytes in patients suffering with leucocytosis, and also as to how extensive is the influence of pyloric obstruction and gastrectasis.

We are inclined to the belief that an excess of large mononuclear leucocytes as against lymphocytes is of distinct value in the diagnosis of carcinomatous cachexia in distinction to pernicious anemia; as against tuberculosis it is less suggestive.

The chemical studies of the blood in cancer have not been elaborate or complete. The specific gravity has been found reduced by Deveto,[23] Peiper,[24] Schmaltz,[25] Schalkoff,[26] Moraczewski,[27] Grawitz,[28] Strauer,[7] and others, not always by the reliable method of weighing. In two of our

Cases (II. and IV.) estimations were made by filling a 5 grm. picnometer with blood from several deep lance-punctures in the ring-finger, and weighing; the figures were 1047, 1048.7, respectively. The diminution seems to be caused only partly by the oligocythemia and partly by a hydremia of the plasma (von Jaksch).[29] The same author has noted a reduction in the nitrogen, but this cannot without more data be attributed entirely to a hypalbuminosis, which Bleibtreu[30] could not confirm. Biernachi[31] believes that hypalbuminosis exists, especially in the red cells. He studied the salts and found a moderate diminution in the iron and a more marked decrease in the potassium and in the phosphates. (In his later work he denies that the iron is at all diminished.) There seems to be an increase in the chlorides both in the plasma and in the tissues (Landenberger,[32] Schäpp,[33] Moraczewski[34]). Just what relation this fact bears to the relative proportion of sodium and potassium, the gastric anacidity and defective alimentary absorption, and the tissue hydremia and increased nitrogenous disintegration, as revealed by a disproportionate output, is very obscure.[35] The facts are not peculiar to cancer. The dried residue is much reduced.[36] Müller[37] and Grawitz[28] believe that there is a decided hydremia (denied by Hammerschlag[38]), which Grawitz believes is due not solely to metabolic and nutritional disturbances but also to the lympogogic action of some toxic substance, and he has detailed experiments in which cancer extract was injected into rabbits, resulting in the production of hydremia and the diminution of the specific gravity and dried residue—just the opposite to what followed the injection of tuberculous extracts. The alkalinity has often been described as decreased, but, with the exception of the cases of Klemperer,[39] who found the CO_2 greatly diminished, the methods have not been accurate. There is, however, evidence that both organic and inorganic acids are increased, with increased basic capacity.[35] Freund[40] in a large series of cases described an excess of sugar in the blood, and also noted a reduction after operation (analogous to the reduction in leucocytosis after operation), and his results have been confirmed by Trinkler.[41] Matfaie,[42] however, denies that this is constant or characteristic.

Literature References.

1. Laker: Wien. med. Wochenschrift, 1886, Nos. 18 and 19.
2. Bierfreund: Langenbeck's Archiv, xli.
3. Reinbach: Ibidem, 1893, p. 486.
4. Rieder: Beiträge zur Kenntnisse der Leukocytose, 1892.
5. Cabot: Clinical Examination of the Blood, 1897.
6. Haberlein: Münch. med. Wochenschrift, 1888, No. 22.
7. Strauer: Systematische Blutuntersuchungen bei Schwindsuchtigen u. Krebskranken, Diss., 1893.
8. Loos: Wien. klin. Wochenschrift, 1892, 281.

9. Andral et Gavoret: Traité de hématoclinique, 1843.
10. Lücke: Das Carcinom, 1867.
11. Paget: Lectures on Surgical Pathology, 1870.
12. Hayem: Compte. rend. Soc. Biol., 1871, 17, 58, 4, p. 270.
13. Alexander: De la leucocytose dans les cancers, 1887.
14. Pee: Arch. f. klin. Chir., No. 46.
15. Schneider: Wien. klin. Wochenschrift, 1890, No. 36.
16. Epstein: Wien. med. Presse, 1894, No. 53.
17. Gumprecht: Deutsch. Arch. f. klin. Med., 1896.
18. Müller: Prag. med. Wochenschrift, 1890, No. 17.
19. Schneyer: Zeitschrift f. klin. Med., No. 47.
20. Hartung: Wien. klin. Wochenschrift, 1895, p. 697.
21. Hausmann: Wien. klin. Wochenschrift, 1896.
22. Capps: Bost. Med. and Surg. Jour., 1896.
23. Deveto: Zeitschrift f. Heilkunde, No. 9.
24. Peiper: Central. f. inn. Med., 1891.
25. Schmaltz: Deutsch. Arch. f. inn. Med., No. 47.
26. Schalkoff: Zur Kenntniss des sp. Gew. des Blutes, Diss., 1892.
27. Moraczewski: Virchow's Arch., No. 144.
28. Grawitz: Klin. Path. des Blutes, 1896.
29. von Jaksch: Verh. d. Cong. f. inn. Med., 1893.
30. Bleibtreu: Deutsch. med. Wochenschrift, 1893.
31. Biernachi: Wiener med. Wochenschrift, 1893; Zeitschrift f. klin. Med., No. 23 and No. 32; Zeitschrift f. phys. Chem., No. 19; Münch. med. Wochenschrift, 1894.
32. Landenberger: Zeitsch. f. klin. Med., No. 19.
33. Schöpp: Deutsch. med. Wochenschrift, 1893.
34. Moraczewski: Virchow's Arch., Nos. 139, 146.
35. Neubert: Stoffwechselsuntersuchungen bei Krebskranken, Diss., 1889; v. Norden: Path. des Stoffwechsels, 1893.
36. Stintzig u. Gumprecht: Deutsch. Arch. f. klin. Med., No. 53.
37. Müller: Zeitschrift f. klin. Med., No. 16.
38. Hammerschlag: Zeitsch. f. klin. Med., No. 11.
39. Klemperer: Charité Ann., Vol. 15.
40. Freund: Wien. med. Blätter, 1883, Nos. 9 and 36; Verhandl. Cong., f. inn. Med., 1889.
41. Trinkler: Centralbl. f. d. med. Wiss., 1890.
42. Matfaie: Pest. Med. Chir. Presse, 1885.

SOME PERSONAL OBSERVATIONS UPON THE EFFECTS OF CHANGES OF CLIMATE UPON MEN AND ANIMALS.[1]

BY RICHARD COLE NEWTON, M.D.,

Montclair, N. J.; late Assistant Surgeon, U. S. Army; Visiting Surgeon to Mountain Side Hospital; Surgeon to the Greenwood Lake Division of the Erie Railroad, etc.

"ABILITY to meet the environment" has been defined as "the condition of leadership."[2] It is, without a doubt, also the condition of health. When we speak of climate and change of climate it is doubtful whether we appreciate how comprehensive these terms really are. Climate, from a therapeutic stand-point at least, should be defined to mean a man's environment, the resultant of the combination of a number of forces, some of which can be weighed and estimated, and some of which have up to the present time eluded, and perhaps always will elude, the most painstaking investigations.

The complexity of the problems presented by the study of climatology has doubtless discouraged many from undertaking it, and has rendered the labors of others more or less futile. But the time has now come when these questions must be studied, and, if possible, settled; and this society would be recreant to its trust and unworthy of its lamented founder[3] did it not keep in touch with the noble body of scientific workers who are, one after another, attacking the problems of pathology, and are even now in many quarters dispelling the clouds of ignorance and superstition which have so long obscured the fundamental truths upon which the laws of health and disease are based. The great need, which I think we all appreciate, in the study of climatology at the present moment appears to be more investigation of individual cases, more ascertained and established facts in relation to the action of climatic changes upon people or animals. It therefore seems proper to urge every observer to make his experience known, no matter how limited it may be, and so add to the storehouse of the facts of climatology (at present only too meagrely supplied) and, according to his ability, provide the means for the deductive study of this intricate science.

The foregoing thoughts have led me to record my personal experience in the climate of the southwestern section of the United States while serving as an assistant surgeon in the army, in the hope that some, at least, of my observations may help along the great study which this society has undertaken to advance.

When I reported for duty at Fort Stanton, New Mexico, in November,

[1] Read before the American Climatological Association, at the Fourth Triennial Session of the Congress of American Physicians and Surgeons, at Washington, D. C., May, 1897.

[2] By President Eliot, of Harvard University.

[3] The late Dr. Loomis.

1879, I found myself in a beautiful spot nearly surrounded by mountains. The post is 6150 feet above sea level, the climate mild and delightful, but, to me at least, somewhat enervating. It took me three or four months to get quite used to the altitude.

I remember that on two or three occasions I spat a little blood and that for a time I had to be content with very little physical exercise on account of muscular weakness and shortness of breath. I remember how startled I was, upon attempting to chop some wood (an exercise to which I had been somewhat addicted), when seized by a painful contraction of the recti abdominales muscles. However, these are only common experiences of people who have ascended into high altitudes.

As I looked about the post, I was struck by the number of carcasses of cattle which were lying about drying up in the fine bright sunlight. I was told that these animals had perished from Texas fever or had been recently driven up from Texas and had died from the cold. I was told that the cattle who give the fever are themselves free from it. This remarkable statement was then generally accepted; but, as I suppose you are aware, it has been disproved by the researches of Smith and Kilbourne[1] and others. The cattle which bring the fever from the Gulf-coast counties of Texas, where it is endemic, are themselves sick with a chronic or subacute form of the disease, which, by reason of their acclimatization, does not seem to inconvenience them very much, nor does a change of climate apparently bring on a marked exacerbation of the fever. But their blood contains the microparasite of the disease, as proved by Smith and Kilbourne. Years ago Professor Law, I believe it was, pointed out that the southern Texas cattle have universally an enlargement of the spleen and a low grade of fever, and, while on their natural ranges, never get fat. Hence, for commercial reasons, they have to be driven away from the infected districts into northern pastures, where, after a time (so far as I know) not yet determined, their blood finally purges itself of the fever parasite, and their condition markedly improves. Like the poor and miserable of the human species, these beasts are prolific breeders; and, as there are no severe frosts in southern Texas to kill the calves, and as the grass flourishes all the year round, this part of the United States furnishes an especially favorable breeding ground for neat cattle.

As already stated, the specific cause of the Texas cattle fever is a micro-organism, which invades the blood discs in apparently the same manner in which the *Plasmodium malariæ* invades the human blood corpuscles. The infection, we are told, is carried from the southern cattle (whose blood already contains the micro-organism) to the northern cattle by the cattle tick. This is a parasite which abounds freely in the South, and which attaches itself to the cattle and sucks their blood. It is dropped off along the ranges which they traverse and, attaching itself to any

[1] Bulletin, No. I., 1893, U. S. Dept. of Agriculture, Bureau of Animal Industry.

other cattle that may cross the same range, introduces the specific micro-organism into their blood. There the germ multiplies and produces the well-known symptoms of Texas fever in its new host.

This whole process reminds one strongly of Dr. Patrick Manson's theory with respect to the transmission of the malarial parasite by means of the intervention of the mosquito. In short, the whole history of Texas cattle fever reminds one strongly of malarial fever in man, and it is fair to presume that further elucidation of the biology of the specific parasite of the former disease will throw a strong side light upon some of the unexplained points in the life history of the specific germ of the latter.

The peculiarly forlorn appearance of the cattle just driven up from the Gulf-coast counties of Texas is quite striking, and the name applied to them—*i. e.*, "dogies"—is a frequent term of contempt and ridicule bestowed upon people and things generally in Texas. These "dogies" will weigh, perhaps, six or eight hundred pounds. They have long, shaggy, rough coats, long heads with enormous horns, long tails, and small, ill-developed bodies. They are thin and badly nourished to a degree, and a large percentage of them will die at the first hard frost. Of a number of them driven into the Panhandle of Texas or New Mexico, perhaps half or two-thirds will live through the first winter. In the spring another trial awaits them, namely the heel fly, a pestiferous insect which bites the poor beasts just above their hoofs and drives them at full speed into the nearest water. It is a curious and rather comical sight to see some staid old cow or solemn lanky steer, which had been quietly browsing, suddenly snort, lift up its tail, and start on a wild run for the nearest pool or stream. Once in the cold water it is free from its tormentor, but frequently the shock of the cold is so great that the animal cannot get out of the water, but falls down, and unless rescued soon dies, and many of those which are drawn out, after having been in the water for some time, succumb from the shock to their weakened systems. Fortunately, the onslaughts of the heel fly lasts only a few days. It is during the first warm days of early spring, before the ice is all gone from the streams and ponds, that this peculiar insect abounds.

If the cattle survive until the grass is fairly started, they soon begin to improve wonderfully, and by fall no one would recognize in the smooth, round, and well-grown cattle the wretched "dogies" of the previous season. Their increase of weight amounts to several hundred pounds the first year. But they were generally kept on the northern ranges two or three years before being driven to market, by which time they would about double in weight. If, however, they were driven to Oregon and other places considerably further north, they would in two or three years triple or even quadruple their weight, certainly a remarkable effect of a change of climate. It was commonly believed in the Texas Panhandle that, after a

winter there, the southern cattle were again susceptible to Texas fever, and this had always been my own opinion. I see, however, that Drs. Smith and Kilbourne seriously question the truth of this opinion, and believe that the cattle, having once recovered from the fever, are probably subsequently immune. This very interesting point requires further study.

After a sharp frost there will be no further fever in northern Texas or New Mexico until another drove of southern cattle comes and brings the germs, and cattle suffering from the fever, if subjected to frost (if they are not killed by it), will soon recover from the fever. It is highly probable that the constant presence of Texas fever on the southern cattle ranges is the explanation of the poor condition of the cattle, but it is not likely that in that elevated temperature the cattle ever would get very fat if there were no fever there. It seems to require plenty of cold weather, as well as good food, to make fat cattle.

In respect to horses brought into New Mexico for the use of the troops, I noticed that they were nearly all afflicted at first with what seemed to be a sharp attack of ordinary distemper. These horses were largely bought for the government in Illinois, Iowa, and other middle Western States, and were transported by railroad to the point nearest to the post and then driven the rest of the way. (It so happened that nearly all of my stations were a considerable distance from the railroads.) The journey into the post had to be made with the utmost care. A little over-exertion would kill the more severely affected of the horses. I remember that the animals were feverish and would not eat. Their coats were rough and lustreless, and some of them had swelling of the maxillary glands. In some cases these glands suppurated and had to be lanced, or even broke spontaneously. There seemed to be the same differences in the way this fever of acclimatization affected the horses that we noticed among the recruits. Some were very sick and a few died, while the majority were only slightly ill, and some of them showed no severity of symptoms at all—an interesting point, which indicates that animals also have the same varying susceptibility to disease that man has. After two or three months the horses seemed to be completely acclimatized, but it was a long time before they could endure as much hardship as the native animals, if, indeed, they ever did become so tough. I remember another curious thing about horses on those western ranges. After a long, cold winter, when they had had little to eat, they became completely covered with lice. A more disgusting and pitiable sight it is hard to imagine.

The acclimatization of western horses brought to the Atlantic seaboard takes at least twelve months and often twice as long. This seems in many cases to be due to bronchial troubles, which the animals contract in our damp climate, and which are difficult to get rid of. I have a horse now that for two winters after I bought him coughed and discharged mucus freely from his nostrils, so much so that I supposed he had consumption.

He has recovered completely, and I think that he is not only a better horse than when I got him, but a better horse than he ever would have become had he remained in Michigan, where he was foaled. I have no doubt that it is harder to acclimatize horses from the middle West upon the Atlantic seaboard than in the Rocky Mountains, on account of the greater severity and changeableness of the climate.

The only other animals which I had opportunities of observing after a change of climate were a few dogs, and they seemed to endure the changes well, thus sustaining their reputation of being able to live in a greater diversity of climates than any other animal except man. As to the effect upon the health of men and women generally of a change from the Atlantic States to New Mexico or northern Texas, as a rule the effect was beneficial. Most of the men who came under my observation and who had changed their residence from the seaboard were recruits, and were young selected lives and better adapted to undergo vicissitudes of all sorts than people sent west for their health, and in that respect my observations would differ from those of observers who practise in the far West and see, for the most part, invalids who have been referred to them by eastern practitioners.

During my eight years' service in New Mexico, Texas, and the Indian Territory I saw almost no nephritis and very little rheumatism; and, as regards the welfare of sufferers from the latter complaint, I am disposed to disagree with Dr. Solly,[1] who esteems altitude inimical to them. I did see some severe attacks of acute articular rheumatism, which originated in the places mentioned, but they were not frequent. They seemed often to be, at least in part, due to the excessive use of alcohol, and were quite amenable to treatment if abstinence from liquor could be enforced. It was a common saying out there that cases of rheumatism contracted in that climate would get well if sent east, and that cases contracted in the East would get well in their climate. The first proposition seems to be borne out in a few cases which came to my knowledge. I do not remember to have met with any instances bearing upon the second.

It was also a common saying among the army officers that children brought from the East to the Rocky Mountains would do well, but that those taken from the mountains to the seaboard would do badly. Both of these statements I think are true. I do not believe in extreme changes of climate for infants and young children, but I feel satisfied that a change from a higher altitude to a lower is far more dangerous for these little people than the opposite change. Leaving out some cases of malarial fever, I can scarcely recall a death of an infant in my practice during my western service, whereas I can recollect a number of small children of army officers who died after having been brought east. One of these was my own child, aged four years at the time of his death. His brother, aged six months, was apparently well when the elder boy died, but soon began to

[1] Hare's System of Therapeutics, Vol. I., article on Climatology.

develop symptoms of disturbed nutrition. He was in a precarious condition for months. He had rickets and did not walk until nearly three years old. He is now nervous, has flat feet, and is less robust than his younger brother, born in New Jersey. But I am glad to say that the fine climate of his present home agrees with him, and, as he gradually improves, we hope that he will grow up a stalwart man. It is only fair to state that both of these children had been exposed to malaria. Malaria is the stealthy enemy of the weak and unacclimated, and seems to attack with especial violence any one who has recently undergone the shock to the nervous system which change of climate undoubtedly produces.

At Fort Stanton I saw a few cases of aneurism, more than I have seen in the fifteen years since I left there. A few of them died from rupture of the sac.

At this same post I saw a few cases of so-called mountain fever. They all had petechiæ. One of them died of intestinal perforation, and an autopsy showed that the condition was typhoid. These cases were all, I believe, contracted in Fort Cummings, N. M., where the typhoid infection was in the drinking water. The only remarkable thing about them was their excessively short duration and mild and uneventful course. The fatal case had not been confined to his bed, temperature had not, so far as known, exceeded 100° F., his diet had not been restricted, and he had been dosed freely with quinine, upon the supposition that his fever was malarial. The intestinal rupture seemed to have been brought on by a walk of about a mile in length which he had asked permission to take.

I never saw, in my whole army experience, a case of heat-stroke nor one of subacute thermic fever, nor any other cases of mountain fever than those just mentioned.

At Fort Elliott, Texas, which is about 3500 feet above sea-level, I had considerable civil practice and quite an opportunity to observe the women of the country. There are always in and about army posts a considerable number of women and children; I mention these facts to give proper weight to what I am about to say. Among newcomers in these regions disorders of menstruation were exceedingly common, but were not, in my experience, more frequent nor more severe or protracted than are the same disorders among the German, Swedish, and especially the Irish immigrants whom I now see in my practice. Nor do I think that nervous or mental troubles were more severe or intractable than they are on the seaboard, and this in spite of the poor and restricted regimen and dearth of amusements and of intellectual pursuits. One great privation which we experienced in practising medicine in Texas and New Mexico was the want of milk and fresh butter. This want is no doubt now better supplied than it was ten or fifteen years ago, when the cattle were mainly wild range cattle and no one thought it worth while to "gentle" the cows and milk them.

From a surgical aspect the virtues of the aseptic climate of the Rocky

Mountains and their foot-hills are too well known to require any detailed testimony from me. Wounds always did well. I saw the knee-joint opened and a floating cartilage fished out without aseptic precautions or antiseptic treatment, and the man was entirely well in two or three days. I reported a gunshot wound of the liver followed by complete recovery in July, 1881. I saw several cases in which bullets went completely through the lungs, with recovery. I reported two cases of double, compound, comminuted fracture (gunshot) of the extremities in the *Medical Record* of July 16, 1887, one of both arms, and the other of both legs, with recovery.

I quote from the closing paragraphs of that report: "It would not be just to omit mention of the action of wounds in the climate of New Mexico, which is so dry, so equable, so mild, and delightful. * * * The efficaciousness of the climate in lung complaints is well known, and its salubrity, shown in the healing of wounds, is, I believe, as great, although, perhaps, not so familiar to the profession." It was then pointed out that in treating the wounds described no proper antisepsis was carried out, and yet they healed kindly, although they had certainly been exposed to infection for hours before they were dressed at all. The report then proceeds: "The beneficial action of the climate of New Mexico, upon consumption and wounds alike, might be construed as supporting the theory of the local origin of phthisis. At all events, wounded surfaces and diseased lungs enjoy a remarkable opportunity to recover in the localities mentioned." This was written before the writer knew anything of the tubercle bacillus, and when he knew very little about the means of the infection of wounds.

Of diseases among the Indians, I saw but little. They seemed, in the Indian Territory, quite susceptible to malaria and had learned to beg for quinine, which they took greedily. Those who could talk a little English would hold out their hands and ask for "white powder." If a small amount was poured into the palm, the applicant would say "heap, heap!"

While campaigning, or "scouting," as it is generally called, with Indian scouts I have heard them coughing all night long, and was told by the officer in command that they were very subject to colds, especially after they had taken a sweat bath. Once in a while, probably every two or three months, the New Mexican Indian builds a little oven or tent of withes and covers it with skins until it is nearly air-tight. He then heats a number of stones and lays them upon the floor of the little oven and covers them with a blanket. He will then crawl in himself and lie there and sweat for two or three hours, after which he will run and plunge naked into an ice-cold stream. This procedure often resulted in severe colds. Whether it had always been followed by colds, or whether the red man is deteriorating physically and takes cold more easily than he formerly did, I am not aware. But the impression among white men who were familiar with their ways of life was that they could not endure as much as they once could.

I saw one young Indian, to all appearance dying of consumption, at Anadarko, I. T., and was told that he had returned not very long before from the Carlisle school. It would appear that phthisis is not an unfrequent result of the higher education among the red men as well as among the pale faces. I do not remember having seen a case of phthisis among the whites in the Indian Territory. That it may exist among the Indians and not among the whites of the same locality, Surgeons Chase and Barker[1] assert in describing the climate of Washington Territory. They say, "Not a case of phthisis originated in the place, but two or three cases which were imported improved rapidly under treatment. Phthisis, however, is very prevalent and very fatal among the Indians."

We perhaps too often lose sight of the fact that phthisis is especially the disease that cuts off those who have given up a roving or out-door life for a stationary or confined existence. It is the disease which destroys those who have exchanged a favorable for a less favorable environment or occupation. The mere moving about, even to less salubrious climates, appears to prevent the oncome of this malady. It has been pointed out[2] that the animals in a travelling menagerie are much healthier than those of the zoölogical gardens, although in the latter place they have every care and attention that science can suggest. The same writer speaks of the remarkable healthiness of gypsy children. He thinks that man was so long a wanderer on the face of the earth, constantly shifting his quarters to hunt for food, escape from or pursue his enemies, and so on, that we are stamped with a nomadic tendency and that it shows itself at times in a craving for change of air.

That this theory may be a correct explanation of the undoubted benefit which change merely as change frequently confers upon the health, I think is rendered probable by the physical history of the Indians. I do not believe that a case of phthisis was ever known among them until they were confined more or less permanently to one spot and prevented from going upon their hunting and war-like excursions. Now, like the caged animals in the museums, they are beginning to die of tuberculosis.

This is not because the modern Indian has given up living in tents and is thus deprived of the accustomed amount of fresh air. His unerring instinct warns him not to live in the houses which mistaken philanthropy or enterprising government contractors have in some instances built for him. He may consent to keep his ponies in the houses, especially in stormy weather, but he will not live in them himself.

These thoughts lead to the suggestion that we are often too ambitious in ordering our patients change of air. They do not need to go a thousand or two miles to obtain fresh air and that change in their way of

[1] Bell's Climatology and Mineral Springs of the United States, p. 234.

[2] Dr. Louis Robinson, National Review, quoted by Dr. St. Clair Thomson, Therapeutic Gazette, 1896, p. 570.

living which their health demands. They need more hygiene, more exercise, more sunlight, and probably a better diet. The immunity of sailors from phthisis is too well known to require comment. In these days of rational therapeutics, now that we cure typhoid fever and heart disease by bathing and exercise, myxedema by a special food, idiocy by graduated educational exercises, scurvy and rickets by a change of diet, and so on, why should we not inaugurate a system of treating phthisis by establishing roaming bands of consumptives, who shall live in the open air, and wander from place to place, not living in institutions or sanitaria, but in wild, free nature? Dr. Henry I. Bowditch's father seemed to cure himself of phthisis by a carriage journey from Boston to Albany,[1] and his making his children take a daily walk of two or three miles is an example to us all. I still revere the memory of my own father, who caused me to walk to school and back every day. The distance was two and a half miles. Regular, systematic, not too severe exercise in the open air *every* day is what is needed to establish and develop such a constitution in the growing child that he will not be liable to phthisis.

However, this paper is already too long. I would sum up my observations as follows:

1. That the change of climate from the Rocky Mountains to the seaboard is more severe and dangerous than the reverse, especially to young children and horses.

2. That a medium or even high altitude is rather beneficial than otherwise to nervous diseases and the diseases of women, as well as to phthisis, and is not unfavorable to rheumatism.

3. That in the climate of northern Texas and New Mexico nephritis in all forms is exceedingly rare, while aneurism is somewhat common in the latter territory.

4. Wounds do remarkably well in all the parts of the Southwest in which I served, even in Fort Sill, which is unhealthy by reason of malaria.

5. That the ideally wholesome and satisfactory life is a nomadic one.

6. Let us remember that *cœlum*[2] *non animum mutant qui trans mare currunt.* Change of climate does not bring change of disposition, nor, for that matter, of predisposition. Precious and even invaluable as change of climate often is in a number of diseased conditions, it is not always what is most needed.

Let us more often be content with smaller doses of climate and supplement them with larger doses of hygiene both moral and physical.

---

[1] Transactions Amer. Climatological Assoc., 1889.

[2] The proper translation of *cœlum* in this line is "climate." See note to Lincoln's "Horace," line 27, Epistle xi., Epistles of Horace, Book I.

REVIEW OF MEDICINE.

MEDICINE.

The Diagnosis of Typhus Abdominalis. (*Deut. med. Wochenschrift*, April 8, 1897.) By E. Zeimke, M.D.

Six cases of typhoid were carefully investigated. Of these four were confirmed by autopsy. All gave a typical reaction, both in bouillon and in the hanging drop, with various cultures of typhoid fever bacillus obtained from various sources. In some of these cases the reaction occurred when the dilution was as low as one to fifty, and even one to one hundred with certain cultures. In one case, where pneumonia also was present, and in one, where the disease was complicated with tuberculosis, the reaction occurred quite as well as in those in which no other infectious agent was active. All these cases were also tested with cultures of the colon bacillus; in one case only a typical reaction occurred. The culture produced coagulation in milk, the indol reaction, and the formation of gases and acids; nevertheless there was a typical agglutination with a dilution of one to fifty. Twenty-eight cases of other diseases were now carefully investigated in order to test the pathognomonic value of the method. Of these, six gave a typical typhoid reaction in a dilution of one to ten, so that no difference from the genuine typhoid reaction could be recognized. These cases represented such various diseases as malaria, tuberculous meningitis, polyarthritis, chronic rheumatism, and hysteria. In one case the reaction occurred when the dilution was as low as one to twenty, and Zeimke concludes very positively that the reaction is not specific for typhoid fever, and, as a means of diagnosis, is not more valuable than hypoleucocytosis or the diazo-reaction. He finds that the blood of typhoid fever patients is not bactericidal, as in bouillon cultures that had become perfectly clear, at the end of a week turbidity was noticed, beginning at the top and extending downward, and at any time, inoculations from diseased cultures produced a luxuriant growth. SAILER.

The Leucocytic Degeneration in the Blood in Leukemia and Severe Anemias. (*Deut. Archiv f. klin. Med.*, December 18, 1896.) By Dr. Gumprecht.

As it is well known that in the majority of cases of leukemia the elimination of the uric acid or the alloxan bodies is increased, and that there is a close relation, in the normal body, between cellular destruction and the excretion of uric acid, it seems reasonable to expect that in leukemia we should find cells degenerated according to one or another of the well-known morphological types of cellular degeneration. The author, having studied leucocytes from various regions that had been exposed outside of the body,

found that they exhibited the typical changes of hypochromatosis—*i. e.*, the nucleus became irregular, its structure was lost, and the chromatin gradually disappeared. Similar changes occur in the leucocytes in various severe diseases of the blood, particularly leukemia, in which the variety of the degenerative forms of cells is the expression of the destruction of nuclein, that has long been postulated by the chemists. Altogether thirteen cases were studied: two of acute leukemia, in which the percentage of degenerated cells was respectively 11.5 and 4.6; one of subacute lymphatic leukemia, with 2.3 % degenerated cells; three of chronic leukemia, in which the percentage of degenerated cells ranged from .5 to 3.8; four cases of pernicious anemia, the percentage ranging from 0 to 10; two of secondary anemia and one of chlorosis, in both of which very few were discovered. The various types of cellular degeneration are as follows: Hypochromatosis, in which the nucleus retains its structure, but becomes paler and the chromatin is changed into fine granules; and hyperchromatosis, characterized by an increase in the nuclear chromatin, usually in localized masses. Often the nucleus undergoes fragmentation, the fragments staining intensely and becoming smaller until finally they disappear. The changes occurring in the blood itself, as observed by Gumprecht, are as follows: in the small lymphocytes there is some paleness of the nucleus; later the nuclear membrane yields and the nuclear substance projects through it. Sometimes when the whole nucleus is affected it is enlarged and assumes an irregular wrinkled appearance, the protoplasm adhering to it only in parts. In the next degree of degeneration the nucleus is larger, free from protoplasm, stains readily, and is of irregular contour. Usually there is no longer a difference in the nuclear wall before chromatin structure. The average size of these degenerated nuclei is 13.5 μ and that of the normal lymphocytes 6.9 μ. These larger nuclei show marked vacuolization and a peculiar modification of the stains, although these changes can usually be corrected by the use of acid solutions. Sometimes, however, hyperchromatosis also occurs, the chromatin forming irregular fragments or being collected in a single mass in one part of the nucleus. In the polynuclear cells degenerative changes are less frequent, but may be suspected in those cases where the nuclei are more numerous than is usually the case and more irregular in outline. Myelocytes frequently show hypochromatosis. The nucleus barely takes the stain. The cell loses its distinct outline and often disappears completely, leaving free nuclei in the blood, which are in many cases surrounded by masses of eosinophile or neutrophile granules. Even the membrane of the nucleus itself may become irregular and lose its distinctness. The substance of the nuclei then becomes homogeneous and filled with minute granules. In order to assure himself that these degenerative types were not artefacts, Gumprecht subjected some specimens of normal blood to various unfavorable conditions, and found that typical degenerated forms never appeared. SAILER.

Sinus Pleuritis. (*Deut. Archiv f. klin. Med.*, December, 1896.) By Eduard Koll.

The author reports a peculiar epidemic that he was enabled to study that occurred in Würzburg in the fall of 1894, and lasted till the summer of 1895. Thirty cases in all came under his observation. The disease was of distinctly infectious character, commencing with a chill, followed by a mild continuous fever, usually reaching 38.5° C. The subjective symptoms involved chiefly the gastric region, where there was intense pain, increased by pressure or the taking of food, and associated with frequent vomiting; some patients also complained of cardiac distress, and, as a matter of fact, in nearly all cases the pulse was extremely rapid. The physical signs consisted of a pleural friction sound heard at the base of the thorax anteriorly, often extending upward along the edge of the heart and sometimes heard also over the sternum. Frequently the rubbing could be heard when the respiration was suspended, being then synchronous with the action of the heart. This friction sound was soft, fine, and best heard at the end of a deep inspiration or at the beginning of expiration. It usually disappeared for two or three hours after forced respiratory movements. Sometimes it seemed as if coming from some deeper location. The course of the disease was characterized by its obstinate persistency, nearly all the cases being obliged to leave the hospital before the physical signs had completely disappeared. Salicylic acid and phenacetin had no effect whatever upon the condition. It was possible to examine seven patients six months after their discharge from the hospital, and in four the friction sound was distinct at the end of this period. Although the disease in many respects resembles diaphragmatic pleurisy, Koll is disposed to regard it as primarily an inflammation of the pleura, originating in the anterior sinus.

SAILER.

Investigations upon Immunity Against Influenza. (*Zeitschr. f. Hyg. u. Inf'kr.*, April 13, 1897.) By Delius and Kolle.

In order to obtain a luxuriant growth, the authors experimented with various forms of culture media, and finally reached the conclusion that mixtures containing pigeon's blood were the most valuable. As it has been proved that the influenza bacillus acts by virtue of a toxin, and that after death, no living organisms can be found in the body excepting, as the authors have shown, in cases of intraperitoneal inoculation of guinea-pigs, it seems reasonable to suppose that it might be possible to obtain an antitoxin. The most convenient measure of doses is had by taking a definite quantity of an agar culture, such as one-fourth or one-half. It appears, however, that the virulence of the culture diminishes rather rapidly if it is kept for any length of time. The authors then endeavored to discover whether the toxin was secreted by the organisms or was inherent in the protoplasmic substance. In order to decide this point, they filtered vari-

ous cultures, and found that in all cases the filtrate was non-virulent or was only very slightly virulent, that is to say, large doses were required in order to produce death. If, however, sterile cultures were injected, sterilization having been produced by chloroform or similar substances, it was found that they possessed full virulence. The authors now undertook a long series of experiments in order to discover if it were possible to produce either active or passive immunity for this organism, but all their experiments were absolutely negative. They, therefore, conclude that the influenza bacillus, like the streptococcus, the diplococcus, and a few other pathogenic bacteria, is of such nature that immunity cannot be attained. They did not, however, deny that possibly there is a brief period of immunity after convalescence from the disease, and explain this by the hypothesis that the cells of the body have learned to form an anti-specific substance, as a result of the continuous irritation by the causes of influenza, but that this capacity is soon lost.

SAILER.

A Probable Diagnostic Sign of Tricuspid Stenosis. (*British Medical Journal*, May 8, 1897.) By James Mackenzie, M.D.

The author divides the venous pulse into that of the auricular type and that of the ventricular type. The pulse of auricular type is produced synchronously with the auricular systole, and is never accompanied by pulsating liver. The pulse of ventricular type is synchronous with the arterial pulse and with the ventricular contraction, and is almost certainly accompanied by a pulsating liver. If, however, there is a diaphragm between the auricle and the ventricle in the shape of a stenosed tricuspid valve, the auricle does not lose its power of independent contraction. On the other hand, the auricle would seem to gain in force from compensatory hypertrophy, and the pulsation may be perceptible in the liver. A pulsation of the liver of auricular type is suggested as a diagnostic sign of tricuspid stenosis. It is the liver pulse and not the venous pulse that is looked upon as being distinctive. In seven cases of tricuspid stenosis this sign has been present and in five of these cases the condition has been demonstrated at autopsy. A large number of cases of liver pulsation of the ventricular type, due to great tricuspid incompetence, and other cases of heart disease, where there was no tricuspid stenosis, have been carefully examined, and in no instance has there been the slightest evidence of the liver pulse of the auricular type. There are three difficulties which occur in differentiating the liver pulse: first, the movements of the liver produced by the action of the heart; second, the pulsation of the abdominal aorta; and, third, the liver pulse of ventricular type in its early stage.

SWAN.

Congenital Dilatation of the Excretory Ducts of the Kidney. (*Gazette des Hôpitaux*, March 27 and April 3, 1897.) By Victor Veau.

In an extensive review of this subject the author divides the cases into

two classes, those which are not and those which are compatible with life. There are three classes of cases which are not compatible with life: first, cases of general distention of the entire urinary system from an obstacle in the neighborhood of the urethra; second, cases of dilatation of both ureters, if these structures are not double; third, cases in which extensive anomalies of the urinary system accompany the defective development of neighboring or distant organs. The cases which are compatible with life are unilateral hydronephrosis of a normal or supernumerary ureter and bilateral hydronephrosis in supernumerary ureters. The diagnosis of hydronephrosis in the fetus is impossible. During pregnancy the development of the maternal abdomen and the difficulties of palpation are generally assigned to hydramnios. Premature labor ought always to make one think of a fetal anomaly, but there is nothing which would indicate that this anomaly is connected with the urinary apparatus. In a second class of cases an infant or an adult will come to consult the surgeon for vague sensations of weight, pulling, or fatigue in the kidneys of several months' duration. Often the urine is cloudy. A careful palpation will reveal a tumor, which, if it projects in the lumbar region, should be readily diagnosed as a renal growth. The diagnosis is more difficult when the growth is not confined to the lumbar region, but is to be palpated only in the abdomen. The diagnosis of localized dilatations of the ureter is easier. The absence of pain eliminates cystitis; the absence of hematuria renders the diagnosis of tumor or of renal calculus scarcely probable. Examination *per rectum* or *per vaginam* or an intravesical examination after the dilatation of the urethra in the female will enable one to recognize a soft, fluctuating, reducible tumor. If the ureter opens freely into the urethra or the vulva, incontinence of urine will be an important symptom.

SWAN.

Note on a Sensation of Painful Pulling at a Distance in Cases of Movable Liver. (*Gazette des Hôpitaux*, April 1, 1897.) By Paul Guéniot.

One of the classic symptoms of movable liver consists in a sensation of pulling in the epigastric region or in the right hypochondrium. This is naturally explained by the traction of the displaced liver. Clinical observation has shown that this sensation of pulling in the epigastrium or in the right hypochondrium may be accompanied by a sensation of pulling behind the sternum, or even at the base of the neck, as if the traction of the liver was transmitted to and was painfully reproduced at such a distance. Anatomically the possibility of a traction being thus transmitted does not appear improbable when one recalls the fact that the liver is suspended to the diaphragm, which in turn is intimately connected with the pericardium by its central tendon. The pericardium presents intimate fibrous connections with the deep cervical fascia. The observation is verified by the report of two cases, one of which has been studied at length. SWAN.

Diabetic Hemiplegia. (*Gazette des Hôpitaux*, April 17, 1897.) By A. Drouineau.

Diabetic hemiplegia probably occurs more frequently than is ordinarily supposed, although the published cases are not very numerous. The condition may appear at all ages and in both sexes. Alcoholism is an important etiologic factor in the predisposition to the condition. Too much importance, however, should not be attributed to the etiologic facts, because in many cases they are negative. In all probability the amount of urine passed is less just before the attack of hemiplegia. There is no relation between the amount of sugar excreted in the urine and the occurrence of hemiplegia. Hemiplegia is probably liable to occur with any form of diabetes. These hemiplegias may be divided into: first, permanent, those which never improve; and, second, transitory, those which disappear, leaving no trace of their presence. Permanent hemiplegia is a phenomenon which is seen late in the course of diabetes. The symptoms may develop suddenly or insidiously. In either case precursory symptoms are liable to be met with in the form of nervous complications, particularly sensory difficulties. Intellectual deficiency, such as is seen in softening of the brain, has been described, and, indeed, cerebral softening is frequently seen at autopsy in this class of cases. According to Lecorché, these prodromes are more marked in the cases in which the onset is insidious, and they indicate poor nutrition of various areas of the brain. Among the prodromal symptoms may be mentioned the development of sadness, of an irritable or an apathetic disposition, or loss of interest, also insomnia, nightmares, vertigo, cephalalgia, diplopia, amblyopia, etc. In some cases the hemiplegia develops progressively, affecting the different segments of the body in rotation. Transitory hemiplegias may develop during any period of a diabetes, even before sugar has been detected in the urine. Prodromes are not frequent in this form of the disease. Sometimes vertigo is felt. These hemiplegias are essentially fugacious; the paralyses are incomplete, and may indeed involve only a single muscle, one half the face, one segment of a limb, or an entire limb. The hemiplegia may be associated with certain monoplegias. Transitory aphasias may make their appearance at the same time as the hemiplegia is noted. Visual affections, sensory manifestations, and abolition of the reflexes have also been noted. *Pathology.*—In all cases in which there has been permanent diabetic hemiplegia, autopsy has shown areas of softening or of hemorrhage of the brain. The hemorrhages may be situated in the brain substance or between the membranes. These lesions are due to obliteration or rupture of a vessel, consecutive to diabetic cardio-vascular lesions. In cases of transitory hemiplegia, miliary cysts filled with blood or with crystals of hematin and miliary patches of sclerosis have been found in the course of the blood-vessels in the brain and spinal cord. Some authors have not found these lesions, however. Lepine and Blanc have observed degeneration of the

ganglion cells and modification of the neuroglia. These hemiplegias have been accounted for by a congestive theory, a theory of dyscrasia, and an anatomo-pathological theory. The duration of permanent hemiplegias is usually short, and death, as a rule, ends the scene. In the transitory hemiplegias the duration varies; but after paralysis is fully established symptoms improve by little and little. They never last long, and always terminate by a complete disappearance of the symptoms. *Diagnosis.*—According to Marie, the diagnosis from hysteria rests upon three points: first, the coexistence of glycosuria; second, the movability and variability of the symptoms, which appear and disappear without appreciable cause; and, third, the efficacy of diabetic treatment. From ordinary hemiplegia it is to be told by the relative rarity of loss of consciousness and of true apoplexy, by the atypical paralytic phenomena, and by the spontaneous tendency to relief. *Prognosis.*—In permanent hemiplegias the prognosis is grave. In the transitory cases the prognosis is good. *Treatment.*—Among the remedies recommended are bromide of potassium, arsenite of sodium, and bicarbonate of sodium. Diabetic diet is necessary.

SWAN.

Multiple Tuberculosis of the Stomach, with a Report of Three Cases. (*Johns Hopkins Hospital Bulletin*, April, 1897.) By Alice Hamilton, M.D., of Baltimore.

The writer reports two remarkable cases of very numerous gastric ulcers that, while they were atypical histologically, showed the presence of the tubercle bacillus. The first patient was a colored woman aged thirty years. There were one hundred and twenty-five small ulcers in the mucous membrane of the stomach. These had overhanging, infiltrated edges. The microscope did not show the usual picture of tuberculosis, but tubercle bacilli were found in the floor and edges of the lesions. There were also tubercular foci in the lungs and intestines. The second patient was a colored man aged fifty years. There were from seventy to seventy-five small ulcers in the mucous membrane of the stomach, which in their gross morbid anatomy and histology were similar to those already described. Tubercle bacilli were found in great numbers. There was tuberculosis of the lung and intestine, the last to a very slight degree. The third patient was a colored girl aged eleven years, with tuberculosis of the lungs, peritoneum, kidney, and bronchial and mesenteric lymph glands. The stomach showed two large ulcers on the posterior wall near the lesser curvature. Their edges were undermined and infiltrated. The histological appearance was typical of tuberculosis, and the bacilli were found in large numbers. The writer has collected from literature fourteen cases of undoubted tuberculous gastric ulcers and nine that are doubtful; of these there are two (reported by Eppinger) that are similar in the number of the lesions to the first two cases. The multiplicity of the ulcers is best

explained by considering them to be the results of ecchymoses that have been secondarily infected by the tubercle bacillus.

STEELE.

THERAPEUTICS.

New Tuberculin Preparations. (*Deut. med. Wochenschrift*, April 1, 1897.) By Professor Robert Koch, of Berlin.

In this exceedingly important article Professor Koch reports his researches upon the possibility of producing artificial immunity against tuberculosis. Immunity against tuberculosis is not single, as formerly thought, but is of at least two kinds. There is an immunity against bacterial products and an immunity against the bacteria themselves. These are not interchangeable and can exist separately. The distinction between the two is of the greatest importance in tuberculosis. Thus, an individual may become immune to the tubercular poison and the lesion heal, but such a person is not proof against fresh infection. It is possible that a bacterial immunity may arise in some forms of acute miliary tuberculosis in man and in animals, as shown by the disappearance of the bacilli in the later stages of such conditions, but, unfortunately, this comes too late to save the individual's life. The reason for the rare appearance of this resistance is that usually the bacteria lie in the midst of necrotic tissue or are cast off from a cavity or ulcer, and so absorption, which is in any event very slow, cannot take place. Attempts to cause more rapid absorption have been unavailing. Dead cultures injected subcutaneously invariably cause abscesses, in the pus of which the bacilli are found unaltered. Injections into the peritoneal cavity give better results, but are in time followed by general peritonitis, and, when injected into the blood stream, tubercles are formed in the lungs, in which the bacilli lie unaltered for an indefinite time. Koch attempted to produce immunity by partial disintegration of the bacilli by the action of strong acids or hot alkalies, without success. Absorption takes place, but protection does not appear, probably because of the profound change in the chemistry of the bacterial body. He then endeavored to extract the immunizing constituents. Injections of tuberculin produced a toxin immunity, but did not protect the animal against subsequent infection. He next prepared a normal salt solution in which he allowed the tubercle bacilli to remain for several days. Almost all the bacilli were then removed by filtration and the filtrate was injected in ascending doses. He designates this solution by the symbol TA. The few remaining bacilli were absorbed, and the animal reacted in a manner exactly similar to that following injections of tuberculin, except that the stage of fever was longer. Before immunity was obtained, the dose reached an amount that invariably caused an abscess, which interfered with the procedure. The idea suggested itself that if the bacilli could be

mechanically altered, they would be more easily absorbed. This Koch accomplished by pulverizing a dried culture in small amounts with a pestle and mortar, with the result that soon the bacilli in the powder ceased to stain with carbol fuchsin. This was mixed with distilled water and centrifugated, the sediment dried and pulverized, and the process repeated until the residue was completely dissolved. The injection of none of these preparations caused abscesses. Koch calls the fluid from the first centrifugation TO and the rest of the preparation TR. TO acted in a similar manner to tuberculin, or TA, except that it did not cause suppuration. It possessed very little immunizing power. TR gave the reaction of tuberculin, but possessed strong immunizing power which was independent of the febrile reaction. When an individual was immunized by it, the protection was against the bacterial product (as shown by the absence of reaction) and the bacteria themselves. Koch considers this proved by a long series of experiments, the details and technique of which are given in full. The point of injection remains absolutely free from reaction, and the neighboring glands are either not affected or are slightly enlarged, but not by tuberculous inflammation. The time of development of the immunity was from two to three weeks after the dose reached good proportions. A tuberculous guinea-pig could be cured by the injection of TR only when the injection was commenced within two weeks of the time of infection. The same rule holds good for tuberculous men in that the treatment cannot be successful if commenced too late in the disease. So, too, if secondary infection with pyogenic cocci is well advanced, the treatment will not avail. Koch has observed marked improvement by this treatment in cases of lupus and also in phthisical cases. In the latter it is not accompanied by the serious reaction that appears after the administration of tuberculin. The râles disappear, the sputum diminishes in amount, the area of dulness grows less, and the temperature becomes normal. He has not observed any unfavorable symptoms after its use.

STEELE.

The Treatment of Malignant Tumors with Cultures of Streptococci and with Mixed Cultures of Streptococci and Bacillus Prodigiosus. (*Centralbl. f. allg. Path. u. path. Anat.*, 1897.) By J. Sematzki.

The author employed Coley's method in four cases, and in all it was without result; nevertheless, as he feels that this method is not absolutely ineffectual, he gives a short history of the cases. In the first, a woman of sixty-five years with cancer of the breast and metastasis, after four weeks' continuous treatment it was evident that the carcinomatous growth had been irritated by the frequent injections and apparently stimulated, so that it became more and more disseminated. In the second case, a woman of sixty years with a sarcoma on the internal surface of the right thigh, the injections with streptococci cultures gave no reaction, and a mixture of

pure cultures of streptococci and *Bacillus prodigiosus* was employed. The temperature rose to 39.3° C., the patient became exceedingly weak, and the metastasis increased very rapidly. In the third case, a child of seven months with angiosarcoma of the veins, a single injection produced such a violent reaction that it was decided to discontinue the treatment at once. Finally, in the fourth case, the patient, a man of thirty-three, suffering with inoperable sarcoma of the bladder, each injection produced an almost immediate chill and rise of temperature to 40° C., lasting sometimes for six hours. No influence was observed upon the growth, and the metastasis increased rapidly, causing death in a short time. The author reaches the following conclusions: The injections are more apt to prove dangerous than beneficial, particularly as they seem to increase the rapidity of the growth of the neoplasm and to cause metastasis. They diminish the strength of the patient by producing an artificial sepsis. The mixed culture of the two organisms seems more dangerous than either one, at least it produced a very stormy general reaction.

SAILER.

Curative Serum for Typhoid Fever, Scarlet Fever, and Pneumonia. (*Zeitschr. f. klin. Med.*, Vol. XXXII., Nos. 1 and 2.) By Dr. Weispecker.

The author reports the results of twelve cases of the three above-mentioned diseases, which were treated by injections of the serum of patients convalescing from the same disorders. The doses employed varied from 10 to 20 cm. In the two cases of typhoid fever the results were as follows: The first was a child of two and a half years; on the ninth day of the disease it was given 20 c. c. of serum; the temperature rapidly diminished, the roseola disappeared within twenty-four hours, the movements became more solid, and the size of the spleen diminished. On the second day the patient seemed normal. The second case, a girl of one and one-quarter years, was given 10 c. c. of serum on the eighth day of the disease; improvement in the general conditions occurred within a few minutes; the fever diminished and, as before, all the other symptoms improved. There was a slight eruption similar to urticaria, but this disappeared in a short time. The first case of scarlet fever occurred in a boy of eleven, who was injected with 10 c. c. of serum on the second day, and within a few hours he was quieter, slept, and had a profuse perspiration; on the same afternoon, although his temperature was still 39° C., he was apparently perfectly well; on the next day there were still slight anginoid symptoms, but the condition otherwise was satisfactory; on the fourth day he was almost entirely well. The other cases were very similar, and in none of them were any sequelæ observed. In the five cases of pneumonia the results were not less extraordinary. In the first, a child of three years, improvement was noted within half an hour; in the second, a

woman of nineteen years, within five hours; in the third, all feeling of oppression had disappeared in ninety seconds; in the fourth, an interval of two minutes was required; in the fifth, no record was given of the interval that elapsed before the subjective symptoms disappeared, in fact there seemed to be a slight extension of the disease, the temperature reached 40° C. in the evening, and the dulness extended from the lower to the upper left lung; however, there was during the next day gradual defervescence and finally a critical discharge. From this time on, the disappearance of the physical signs was very rapid. [The author very justly calls attention to the extraordinary rapidity with which the sensation of well-being follows the injection, but gives no explanation of this phenomenon. Experiments at the Philadelphia Hospital, carried out by Dr. W. E. Hughes and Wm. F. Carter, of Philadelphia, which the abstracter had the opportunity of observing as resident physician, gave quite negative results for typhoid fever and pneumonia, although performed with the greatest care and with much larger doses of serum than were employed by Weispecker.]

SAILER.

Exophthalmic Goitre. Treatment by Splenic Medication. (*American Journal of the Medical Sciences*, May, 1897.)

Dr. Horatio C. Wood records a case of a lady in whom the disease was of six years' duration and the exophthalmus very pronounced; the pulse was about 180; the thyroid was greatly enlarged. Breathlessness was marked, and the general nervous erethism such that the woman was on the verge of insanity. To this patient was given by the mouth immediately a teaspoonful of the glycerin extract of spleen, made in the ordinary manner; it produced at once violent gastric distress accompanied with local pain radiating from the stomach, lasting for some hours, and followed by complete disgust for food. After a few days the dose was again exhibited, and later again, each time with similar result. Following this ten minims were injected twice a day hypodermatically into different portions of the body; they produced much local pain and hardening of tissue, but in no case was there finally abscess; whenever the local symptoms became intolerable the injections were temporarily stopped for a few days, small doses of the extract being given by the mouth. This was kept up for six months, when ten drops of the spleen-extract with ten drops of digitalis were administered three times a day. [It should be noted that early in the case digitalis and all the ordinary treatment for exophthalmic goitre had been tried without result.] The improvement in this case began not a great while after the commencement of the hypoderic injections, and has continued, so that to-day the enlargement of the thyroid gland has entirely disappeared. The general nervousness has also gone, so that the patient is hardly more neurotic than before the attack. The exophthalmus

is less, though still apparent, and the cardiac action is greatly reduced, though the heart remains irritable on excitement. In thirty-five years of practice Dr. Wood has never before seen a case in which the thyroid body was so greatly diminished.

HINSDALE.

SURGERY.

Results of Radical Operation for Hernia. (*Centralblatt f. Chirurgie*, May 15, 1897.) By Kocher, of Bern.

Kocher takes occasion to criticise some of the views of Dr. Coley, of New York, as to his exclusive employment of the Bassini method in the radical operation for hernia. He admits that Bassini has made a valuable contribution to the surgery of hernia, and that in the Bern clinic they resort to Bassini's method in those cases where they can see a special indication for it. Kocher believes, however, that there are certain cases in which the method not only cannot yield good results, but is distinctly harmful. Especially in cases where the surgeon feels it is his duty to operate, as in elderly people or in large herniæ, in which cases suppuration is likely to intervene and the sutures fail to hold, does this method not yield good results, and therefore should not be selected. Kocher believes it desirable to have a method which will not, in the ultimate result, be affected by the occurrence of suppuration. A method which answers this description and that is free from danger, even in elderly individuals, is the so-called "lateral Verlagerungs-methode" described by Kocher himself. Kocher takes exception to Coley's statement that all other methods except Bassini's and modifications of it give good results only in the hands of their discoverers, but for other operators are worth but little, with the remark, that this kind of judgment of methods, which one cannot prove, deserves in his opinion a remonstrance. After Coley's sweeping statement Kocher believes it his duty to prove that his method has met with surprising success not only in his hands but also in the hands of others. To do this reference is made to 197 radical operations which were performed in the years 1894, 1895, and part of 1896. Of the 197 there were 103 of the complete inguinal variety. Healing by first intention occurred in 91.3 %, and these patients were ready to be discharged, on an average, 10.7 days after the operation. Of the remaining 8.3 % the average period of convalescence was 32.6 days. Of 111 cases of inguinal hernia there was recurrence in four, or 3.6 %. In the three and one-half years that this operation has been in use, in 126 cases collected by Beresowsky and Lebensohn the mortality is 0. In the question of recurrence also Kocher's method appeared to better advantage than that of Bassini according to Coley's collection. In Coley's collection of 360 operations, 250 were children under fourteen years of age. In his last

160 cases, only 8 were over thirty years and 2 over forty years of age, while Kocher in 198 cases met with only 20 under fifteen years and 61 cases were individuals over forty years of age. Considering the acknowledged fact that operations in children yield better results than those on adults, the writer claims that it is manifestly unfair to compare Coley's statistics and his, and that, should all cases under fifteen years of age be rejected, the Bassini method as practised by Coley would in no way show superior results. Kocher then goes on to describe a modification of his operation which will more surely prevent a recurrence. In concluding, he reiterates that this method is simpler than the Bassini, and that simplicity and quickness, in the performance of an operation which does not involve much laceration of tissues, the necessity of many sutures, or any bleeding to speak of, are points not to be underrated in operating on elderly people.

FRAZIER.

Further Observations on Fracture of the Neck of the Femur in Children, with Especial Reference to its Diagnosis and its more Remote Results. (*Annals of Surgery*, June, 1897.) By Royal Whitman.

The author reports ten cases of fracture of the neck of the femur which he had seen from three weeks to six months after the accident, and in but one of which a previous accurate diagnosis had been made. As regards the immediate diagnosis he emphasizes the importance of a careful physical examination, which, if accurate measurements have been taken, will allow of no mistake. If a primary diagnosis has not been made, the danger of mistaking the case for one of hip-disease is easily understood when such symptoms as a limp, pain referred to the knee and hip, and pain and restriction of motion at the seat of the injury are present. The points to be remembered in the differential diagnosis from hip-disease are the slow, irregular onset of the latter contrasted with the sudden appearance of the symptoms in the case of fracture. In fracture in the early stages of repair motion is somewhat restrained, but only in certain directions, namely, flexion, abduction, and inward rotation, and is not affected, as in tuberculous disease, in every direction with equal degree. Concerning the differential diagnosis of simple fracture from an epiphyseal separation, Whitman remarks that the latter is usually the result of extreme violence, whereas a milder force would more likely produce a fracture. Epiphyseal separations resulting from traumatism are rare, while those due to acute suppurative disease in childhood are not uncommon. The remote effects of the accident are then taken up. The greatest danger to be apprehended Whitman believes to be the increased shortening and disability due to further descent of the depressed neck of the femur, even though deferred to the period of adolescence. In one case, cited as an example, the shortening when treatment was discontinued amounted to three-fourths of an inch,

with no disability. Fifteen years later there were two and three-fourths inches of shortening, atrophy and version of the limb, and altered gait, the patient walking on the toes of the short leg with a marked limp. Attention is called to the fact that the shortening is not the result of interference of growth, since the distance from the trochanter to the malleoli is the same on both sides, but is rather due to depression of the neck of the bone and elevation of the shaft on the pelvis. These facts are demonstrated very clearly by skiagraphs and diagrammatic drawings. The deformity in these cases is due to three factors: (1) the direct result of the injury, (2) further depression due to early use of the limb during stages of repair, and (3) sinking of the neck due simply to the strain to which it is exposed by the deformity. To prevent the deformity occurring Whitman suggests the wearing of a hip splint or perineal crutch, which should be worn for six months, combined with daily massage and manipulation of the limb in such direction as to prevent secondary contracting of the muscles. Later on, the importance of the avoidance of violent exercise, long standing, or laborious work must be urged on the patient. The facts which Whitman wants to impress in this paper are, in the first place, that fracture of the neck of the femur can, and not uncommonly does, occur in childhood. If not recognized at once it may be mistaken for hip-disease. Epiphyseal separation is a possibility, but, contrary to the accepted teaching, is more apt to follow extreme violence, with non-union of fragments and subsequent disability, the reverse being true in cases of fracture. The peculiarity of this fracture in childhood is that, though the immediate results are extremely favorable, the final outcome is more apt to be a disability more noticeable than after fracture in adult life.

FRAZIER.

The Present Aspect of the Treatment of Congenital Displacement of the Hip. (*Lancet*, May 1, 1897.) By A. H. Tubby, M.S. Lond.

In discussing the treatment of this disabling deformity there are certain factors, always present at birth, which must be considered. The acetabulum is abnormal in shape, being triangular, oval, or elongated. The cartilaginous rim is wanting, and the mass of fat at the fundus of the acetabulum is hypertrophied. The head of the femur is round, irregular, or flattened, and its neck short and conical, forming an angle more obtuse than in normal cases. The round ligament is flattened, shorter, and sometimes absent, while the capsule is elongated and thinned. There are also some displacement and considerable contraction of the muscles surrounding the joint. In children who have walked a new socket is formed, on which the head of the bone rests, and the neck of the femur may be entirely absent or, if present, is shortened and changes its relation to the shaft, so that in cases of anterior displacement it is bent forward and in those of posterior

displacement it is bent backward. This is an important point in the treatment by manipulation. In adult life these changes become exaggerated. The methods of treatment in vogue are three: (1) extension, either in the recumbent position or by apparatus; (2) operative measures; and (3) forcible reduction. Of the operative procedures those mostly used are Lorenz's and Hoffa's. The results of Hoffa's operation are unsatisfactory. The latter has recorded 112 operations on 82 patients; of these 3 died, 9 had ankylosis of the hip, and 11 had recurrence. The objections to the operation are its severity and, as Hoffa himself states, the inability to effect a perfect cure, since there is always some shortening. Lorenz's operation, that of dividing the tensor vaginæ femoris, hollowing out the acetabulum, and effecting reduction, has the advantage over Hoffa's in causing comparatively little damage to the muscles. Of 63 cases on which Lorenz operated prior to August, 1895, there were no deaths and but three relapses. Since then Lorenz has modified his opinion very much as to the value of his method. The third method, or that of forcible reduction, has been described and is recommended by Paci. Of the three methods mentioned the latter is the one to which Tubby gives preference. He believes recumbency with extension, although fairly tried, has not been quite satisfactory. The open operation of Hoffa he discards as being dangerous and imperfect in its results, while that of Lorenz has been in no sense satisfactory to the originator, who is now changing his opinion in favor of forcible reduction. The advantages of manipulation over operation are the absence of the possibility of later contractions or ankylosis, and its simplicity, which allows children to be treated as out-patients. To sum up, it may be said that the operations of Hoffa and Lorenz are seldom necessary, and should be used only as a last resort. At any age, up to adult life, Paci's maneuvres, as modified by Lorenz, afford the best method of treatment.

FRAZIER.

The Causation of Chloroform Syncope. (*British Medical Journal*, April 17, 1897.) By Leonard Hill, M.B.

In a paper which is "directed towards the establishment of the true pathological cause of chloroform syncope," the author attacks the evidence furnished by the Hyderabad Commission, and brands as "pernicious doctrine" the theory that action on the respiration is the cause of this condition. After an exhaustive study and the record of numerous personally conducted experiments, the author comes to the following conclusions: 1. Chloroform produces a primary failure of the circulating mechanism and a secondary failure of the respiratory centre. The respiratory centre fails to act not only because it is damaged by the drug, but also because of the anemia of the spinal bulb produced by the fall of arterial tension. This is proved by the fact that the action of the respiratory centre can be renewed by raising the arterial tension. The depth of anesthesia depends,

as does the paralysis of the respiratory centre, on the primary fall of arterial tension. 2. Chloroform, more than any other known agent, rapidly abolishes the vascular mechanisms which compensate for the hydrostatic effect of gravity. 3. Chloroform abolishes these mechanisms by paralyzing the splanchnic vasomotor tone and by weakening the action of the respiratory pump. When these mechanisms are totally abolished the circulation is impossible if the subject be in the feet-down position. 4. Chloroform also produces paralytic dilatation of the heart. It acts directly, like amyl nitrite, on the musculature of the whole vascular system. 5. There are two forms of chloroform syncope: (*a*) During primary anesthetization. The patient struggles, holds his breath, raises the intrathoracic pressure, congests his venous system, lowers his arterial tension, and finally takes deep inspirations and surcharges his lungs with chloroform. In the first stage the left heart becomes impoverished; in the second stage it is suddenly filled with blood. This is drawn from the lungs, and is full of chloroform. The chloroform passes into the coronary arteries and the heart is thrown into paralytic dilatation. Respiration and the pulse either cease simultaneously or the pulse ceases before the respiration. (*b*) During prolonged anesthetization. This arises from gradually giving chloroform to too great an extent. The arterial pressure falls lower and lower, and, secondarily, the respiration ceases because of the anemia of the spinal bulb. The heart is not in this case paralyzed by chloroform, because the drug is taken in gradually by the shallow respirations and distributed slowly by the feeble circulation. 6. Artificial respiration and the assumption of the horizontal position, if applied in time, will always resuscitate a patient from the second form of syncope. 7. Artificial respiration, established with the patient in the horizontal posture, is also the treatment indicated in the first form of syncope; the heart should be rhythmically compressed by squeezing the thorax. If this does not quickly renew the pulse, the patient should be put into the vertical, feet-down position. The dilated right heart is thereby completely and easily emptied of blood. Artificial respiration is maintained during this maneuvre, and the patient is brought once more into the horizontal posture. By rhythmic compression of the chest an efficient circulation is maintained through the coronary arteries; by first emptying and then filling the heart a fresh supply of blood is brought into that organ. If this does not prove successful on the first trial, it can be repeated. 8. Inversion—that is, placing the subject in the feet-up position—or compression of the abdomen will increase the paralytic dilatation of the heart. In this kind of syncope both these forms of treatment are worse than useless. 9. In the condition of shock or emotional fear the compensatory mechanism for the effect of gravity is almost abolished, and chloroform may easily be the last straw to paralyze the circulation completely. 10. Vagus inhibition of the heart is of no importance as an agent in the production of chloroform syncope. 11.

Ether is in every respect a far safer anesthetic than chloroform. According to Ringer's experiments on the heart, ether is fifty times less dangerous than chloroform. 12. With the practical conclusion of the Hyderabad Commission that the chloroform inhaler should be removed during the struggling of the patient or when the respiration is of irregular depth, I am in absolute agreement; but I consider their interpretation of their own experiments and tracings concerning the origin of chloroform syncope to be a mistaken one.

SWAN.

Apophysary Ligatures (Contribution to the Therapeutics of Vertebral Deformities). (*Gazette des Hôpitaux*, February 20, 1897.) By A. Chipault.

The author has attempted, first, to substitute the extemporaneous reduction of a deformity of the vertebral column for its slow reduction; second, to assure the immobility of the vertebral column after the deformity is reduced and the column is in good position, not only by the fixation of the patient upon a suitable orthopedic apparatus, but also by preceding this fixation by an operative fixation, which is accomplished by lacing the spinous processes in the region of the lesion together by a silver wire. The technique of the operation is as follows: the patient is placed in the three-quarters prone position. An incision is made in the posterior median line which extends for at least two or three vertebræ above and below the extreme limits of the deformity. This incision should not involve the interspinous ligaments. The muscles are then rapidly dissected free from the vertebræ and held aside by two large retractors. By direct pressure on the vertebral column and by traction made from the axillæ and the lower extremities by two assistants, the deformity is reduced as completely as is possible. After the deformity is corrected, a silver wire is passed through the interspinous ligament above the spinous process of the highest vertebra which is to be fixed. This wire should be passed as close as possible to the base of the spinous process and close to its upper border. After this wire is in place it should be twice as long as the wound on either side of the vertebral column. Then the two ends are passed successively between the spinous processes below the one thus fixed, crossing each other between each, until the lowest process exposed is reached, when the ends are fastened solidly by twisting them together. As the wire passes through the interspinous spaces it should pass close to the lower border of the upper spinous process, and its value as a factor in holding the spinal column in extension should be tested before making a new loop. If the apophyses break under the silver wire, heavy plaited silk may be substituted. Bifid spinous processes may cause difficulty in denudation. If the spinous processes in the region of the deformity are anchylosed to each other, the bony union must be perforated with a suitable instrument.

If there be a partial or total lateral curvature in addition to the antero-posterior deformity, the additional deviation may be corrected by making traction in the axis of the vertebral column and by pressure perpendicular to that axis, pressure pushing back the summit of the lateral curvature. Another method is to carry one end of the ligature up along the side of the vertebral column which presents the convexity of the curvature, and to fasten it to the first loop. The wound should be closed without drainage. The operation is indicated: first, in certain reducible traumatic deformities which are of recent origin or which are movable, the latter variety being very rare; second, in a large number of orthopedic deformities perhaps in torticollis from rheumatic arthritis and in cervico-dorsal kyphosis from anchylosing rheumatism, in the reducible period; possibly in some grave reducible scolioses; certainly in rachitic kyphoses in which the same conditions pertain; in certain of the kyphoses of Pott's disease which are not anchylosed, which are small or medium in size, and which are without complication; possibly in a certain number of other of the kyphoses of Pott's disease, which are not anchylosed. Anchylosed vertebral deviations from whatever cause are inoperable by this method.

SWAN.

Concerning the Total Bilateral Resection of the Cervical Sympathetic as Treatment of Basedow's Disease and of Epilepsy. (*Centralblatt f. Chirurgie*, 1897, No. 2.) By Thomas Jonnesco, of Bucharest.

After nine operations in which he had resected the entire sympathetic nerve on both sides of the neck, Jonnesco publishes the following conclusions: 1. Total and bilateral resection of the sympathetic nerve may be practised without giving rise to secondary troubles. 2. This operation is indicated in Basedow's disease, when the principal symptoms appear to be dependent upon the cervical sympathetic. The operation may be completed by ligature of the vertebral arteries. 3. In epilepsy the physiological experiments and the observation, made by Doyen, of a fit in the course of a craniotomy, demonstrate a perturbation of the cerebral circulation coincident with the attack. The satisfactory results obtained by Alexander and by Jonnesco should encourage surgeons to persevere in similar attempts, which may conduce to the cure of an affection against which the surgeon until now has remained powerless. (*Annales de la Société Medico-Chirurgicale de Liége*, February, 1897.)

SWAN.

Tuberculous and Syphilitic Stricture of the Rectum. (*Gazette des Hôpitaux*, February 11 and 18, 1897.) By Tillaux.

After reviewing the literature of rectal strictures, Tillaux concludes: first, that a clinical type of lesion exists which has been generally described under the name of syphilitic stricture of the rectum; second, that it is possible that tuberculosis can present the features of this type; third,

that it is not proved that the features of this type can be presented by any other affection. If this branch of surgery is to be studied scientifically, inoculation experiments must be made in order to determine the presence or absence of Koch's bacillus. A case is reported.

SWAN.

On Certain Visceral Pathological Alterations, the Result of Superficial Burns. (*Johns Hopkins Hospital Bulletin*, April, 1897.) By Mr. Bardeen.

As a result of autopsies made on the bodies of five small children who had died of severe burns, the author makes the following statements: The most noticeable gross lesions were cloudy swelling of the liver and kidney, acute swelling of the spleen, and swelling and congestion of the lymphatic glands and other lymphatic tissue. Microscopically the most interesting lesions noted were parenchymatous degeneration of the kidneys and liver, focal areas of necrosis in the liver, and pronounced focal necrosis in the lymphatic tissue. The lymphatic tissue was affected throughout the body. The Malpighian corpuscles of the spleen, the tonsils, the gastric lymphatic follicles, the enteric solitary and agminated follicles, and the lymphatic glands, all showed essentially the same changes. The lymphatic glands were much swollen and at times congested. The earliest changes were in the follicles, and consisted of an edematous swelling. This was more marked towards the centre of the follicle. In areas of less advanced alteration the lymphocytes were merely less closely packed together than is usual, but in the areas of more marked change the lymphocytes were swollen and their nuclei fragmented. The focal degeneration in the lymphatic follicles of the tonsil and of the stomach and in the Malpighian bodies of the spleen is essentially similar to that of the follicles of the lymphatic glands. In these areas of degeneration in the lymphatic tissue we find appearances essentially similar to those seen after the injection into the body of various bacterial and other toxalbuminous substances. The lymphatic glands from the cases of skin burn might readily be mistaken for the lymphatic glands of children dead of diphtheria. The lesions in the other organs are also essentially similar to those found in the bodies of persons dead from the acute infectious diseases. It seems, therefore, justifiable to consider that one of the main causes of death after burns is to be sought in a toxemia caused by alterations in the blood and tissues, the direct effect of the elevation of temperature.

SWAN.

Postural Method of Draining the Peritoneal Cavity after Abdominal Operations. (*Bulletin of the Johns Hopkins Hospital*, April, 1897.) By J. G. Clark, M.D.

The benefits to be derived from any form of drainage when used for the purpose of removing infectious matter from the peritoneal cavity are infinitesimal compared with the untoward or disastrous results which may

follow its use. Escape of pus during an operation, oozing of blood or serum, and extensive raw areas in the pelvis are usually supposed to indicate some form of drain. On the contrary, these are the cases which should be left to the care of the peritoneum. In a comparative study of 1700 cases of abdominal section, in series of 100 cases each, of similar pelvic inflammatory affections, the undrained cases presented better results than the drained cases. The greatest safety lies in closing the abdomen without drainage, except in cases of purulent peritonitis or in operations which have involved extensive suturing of the intestines. It is not the method of drainage but the principle which is wrong. The chief objections to the drainage of dependent pockets in the pelvis or abdomen are: first, that fluids are frequently not removed, but, on the contrary, are pent up by the gauze drain; and, second, that, instead of removing infection, the gauze or tube may be the means of introducing it from the outside into the degenerated fluids. To overcome the dangers of dependent pockets and dead spaces in the pelvis, the author suggests the elevation of the patient's body after operation to a sufficient height to start the flow of collecting fluids from the pelvis towards the diaphragm. In this manner the rapid elimination of infectious matter and of vital fluids, which might stagnate in such pockets and form a culture medium for pyogenic micro-organisms, by the normal channels of exit from the peritoneal cavity would be promoted. To avoid the danger of infection, the most scrupulous care should be observed in every abdominal operation to leave behind no condition which may furnish a starting-point for an infectious process. Oozing should be controlled as far as possible, injury and exposure of the peritoneum should be guarded against, raw areas should be covered with adjacent healthy peritoneum when practicable, and all débris and fluids should be removed as far as possible before the abdomen is closed. Dead spaces are nevertheless prone to form, and by elevating the pelvis after an operation the normal intraperitoneal current may be assisted greatly in draining such cavities. The foot of the bed should be elevated about twenty degrees, which will give sufficient inclination to the posterior pelvic wall to assist the flow towards the general peritoneal cavity. This posture should be maintained for from twenty-four to thirty-six hours, after which the bed may be lowered. This is a prophylactic measure, and not a curative one, and is not to be thought of after peritonitis is established.

SWAN.

NEUROLOGY.

A Case of Athetosis with Autopsy. (*Neurologisches Centralblatt*, No. 7, 1897.) By M. Sander, M.D., Irrenanstalt, Frankfurt a. M.

A patient with dementia paralytica had repeated attacks of right hemiplegia. After a paralytic convulsive attack choreiform movements of the

right extremities developed, and later athetosis of the right hand. The movements were so severe that the tendon sheaths became inflamed. In fourteen cases of athetosis in which autopsies have been made, foci were found seven times in the striatum, four times in the thalamus, twice in the pons, and once in both thalamus and striatum. In three other cases only cortical lesions were reported, but the possibility of involvement of the basal ganglia has not been excluded in these. In two reported cases of paretic dementia with athetosis the lesions were limited to the cortex, but in the case published by Sander there was intense atrophy of the thalamus, and to this the writer attributes, in large part, the involuntary movements. The cortical lesions did not differ from those seen in many cases of general paralysis without athetoid movements. The degeneration of the pyramidal tract which, contrary to the usual condition in paresis, was equally intense above the motor decussation, Sander believes was due to the atrophy of the thalamus. The explanation which he gives of athetoid movements is the following: A lesion of the motor tract, which does not completely interrupt the fibres, offers an obstruction to the nerve current passing from the cortical to the spinal motor cells. This causes an "accumulation of energy" on the cortical side of the obstruction, which from time to time overcomes the impediment, and becomes manifested as violent movements. As the intensity of the nerve current and the degree of obstruction remain unaltered, the movements are rhythmical. If the nerve stream is increased, as by voluntary movement, the athetosis becomes more violent; if decreased, as by sleep, it becomes less noticeable, or ceases entirely.

SPILLER.

A Series of Articles on Speech Defects as Localizing Symptoms, from a Study of Six Cases of Aphasia. (*Medical News*, June 6 to September 19, 1896.) By J. T. Eskridge, M.D.

This is a valuable contribution to the subject of aphasia. The patient described in the first paper, a traumatic case, was unable to write and read correctly but, in the careful examinations made after the operations, no mistakes were observed in speaking. No paralysis was found, but right hemianesthesia was present. Two operations on the head were performed, and blood clots and disorganized tissue were removed from the anterior part of the occipital lobe. Some of the symptoms pointed to cerebral abscess, but no pus was detected. Usually in cases of sensory aphasia there is some alteration of speech, some form of paraphasia. Possibly the explanation is to be found in the statement that the patient was not word deaf. Another case is of interest in regard to the graphic centre. This patient had a cyst in the foot of the left second frontal convolution. He was able to copy printing and writing in script, but in writing voluntarily he omitted and added letters, and his spelling was so bad that his writing

was illegible, and yet the individual letters were well formed. He could write, therefore, but could not spell. The ability to copy printing into script is often found in motor aphasia. This patient was able to write readily and correctly when the words were spelled for him. He spoke slowly but voluntarily, and could repeat words after another person, although he frequently omitted the last syllable of a word, and sometimes one or more words of a sentence in voluntary speech. In reading, he not infrequently omitted and miscalled words. Eskridge supposes there may be a cortical centre whose function is to register the memory of the arrangement of letters for the spelling of words. There has been one previous case described by Bar in which the lesion was limited to the second frontal convolution. It seems most probable that in Eskridge's patient there was an alteration of the word percept and not a loss of the power of writing. His ability to write readily and correctly when the words were spelled for him seems to prove this. This case and the one of Bar, in connection with other evidence, make the existence of a graphic centre in the foot of the second frontal gyrus very doubtful. It is difficult to understand why in the case of orolingual paralysis so little importance is attributed to the cysts in the left lenticula, one of which was at a point corresponding to the knee of the internal capsule. The fibres for the tongue and face probably descend in this part of the capsule, and it is a question if a part, at least, of the imperfect articulation was not due to these cysts. All the cases of this series are reported with great exactness of detail and well repay careful study.

SPILLER.

Paralysis of One Third Nerve from Hemorrhagic Neuritis, with Extravasation of Blood over the Opposite Frontal Lobe. (*Edinburgh Medical Journal*, May, 1897.) By G. A. Gibson, M.D., F.R.C.P. Ed., and W. Aldren Turner, M.D., F.R.C.P.

There is no thoroughly authentic case on record in which a unilateral cortical or subcortical lesion has given rise to paralysis of one or the other vocal cord. It has been pointed out experimentally that electrical excitation of the bases of the first and second frontal gyri gives rise to conjugate movement of both eyes to the opposite side, and it has been shown that, if the nerve fibres to the external and internal recti muscles be cut, other ocular movements may be produced by irritation of this region. Unilateral destruction of this area causes temporary inability to turn the eyes beyond the midocular position to the side of the lesion. Removal of both frontal lobes together with these centres is not followed by any loss of the power of conjugate movement of the eyes other than temporary. Hence "cortical ophthalmoplegia" has not been demonstrated experimentally after bilateral lesion of the frontal lobe. No clinical case can be found in which a lesion of the frontal lobe occasioned paralysis of the movements of the

opposite eye, other than that of loss of conjugate movement with its fellow. The writers report the case of a girl who had complete ptosis of the right eye, with dilatation of the pupil and absence of light reaction. The right eye in following an object remained slightly everted. There were no other nervous symptoms. The cause was supposed to be a tuberculous mass involving the right third nerve. At the autopsy no macroscopic lesion of the third nerve could be observed, but a large hemorrhage was found which involved the Sylvian region on the left side of the brain and extended forward on to the frontal lobe. In microscopic examination, however, a condition of hemorrhagic neuritis was found in the trunk of the third nerve, in the portion between the exit of the nerve from the crus cerebri and the entrance into the orbit. The ptosis was, therefore, probably not due to hemorrhage over the opposite frontal lobe.

SPILLER.

Clinical Lecture on Two Cases of Malarial Neuritis with Tremors. (*British Medical Journal*, May 8, 1897.) By Alex. James, M.D.

James states that malaria may cause neuralgia, and that it is especially likely to affect the first division of the trifacial nerve, but may also cause cardialgia, gastralgia, etc. There may be painful affections of the sensory nerves, or localized paresthesia or anesthesia, or disturbance of function of some of the special sensory nerves, resulting from malaria. Malaria may cause paralysis, tremors, cramp-like muscular contractions, or even convulsive movements. These motor disturbances are most frequent in the face. Cases of epilepsy due to malaria which have been benefited by the administration of quinine have been reported. These conditions are due to the malarial organism or its products, and in some cases the malarial element is easily overlooked. The writer describes two cases which presented symptoms of grave organic disease. In one case the pyramidal tracts seemed to be involved, and in the other the sensory parts of the cord appeared also to be markedly affected. In addition to the motor troubles there were disturbances of sensation and equilibration, somewhat like those of ataxic paraplegia. In one case degenerative changes seemed to be developing in the brain as well as in the cord. Two symptoms in these cases were especially noted by the writer, namely, tremor in all the limbs and vesical disturbances. Malaria, like other poisons, may cause tremor. These patients were at first treated with iodide of potassium, salicin, and arsenic, without improvement. Quinine (5 gr.) thrice daily was then given, and the amendment was as distinct as it was immediate: both patients felt stronger, physically and mentally; the tremor diminished and the vesical symptoms improved. Strychnine was also given hypodermically, and later anarcotine was substituted for the quinine. Both patients, at the time the report was written, were still somewhat feeble. The writer regards these cases as due to malarial neuritis. In both patients the knee-jerks were exaggerated and ankle clonus was present.

SPILLER.

PATHOLOGY.

Experiments on the Conditions governing the Chromogenetic Action of the Bacillus Pyocyaneus. (*Beiträge zur klin. Chirurgie*, Vol. XVIII., No. 1.) By H. Noesske.

The partial or entire absence of chromogenesis of this organism when grown on artificial media, such as Pasteur's fluid, etc., or in symbiosis with other micro-organisms, has been shown by different authors to depend (1) upon a sufficient supply of air, (2) upon a suitable culture medium, (3) upon the bacilli themselves, and (4) upon the temperature in which they are grown. The bacillus is found not only in purulent wound-secretions, but also upon furniture, articles of clothing, bedding, etc., soiled with perspiration. It can grow in hydropathic bandage-material and may infect superficial wounds with serous secretion. The blue or green coloring matter may be entirely or partially absent, so that its presence is often detected only by its peculiar aromatic odor or by inoculating suitable culture media, when the chromogenic micro-organism becomes manifest. In his first series of experiments the author shows that the organism grows luxuriantly on sterile pus, but without chromogenesis. The same is true of peptone-cultures or ox-blood serum. On puncture fluid from a hydrocele a yellow color was developed; on potatoes dry, glistening, chocolate-colored colonies were formed. The peculiar aromatic odor when grown on artificial media was often absent or modified, whether chromogenesis was present or not, thus showing that the micro-organism may be present without one or both of these attributes. The more concentrated the culture medium and the more luxuriant the growth on the same the smaller was the amount of coloring matter produced. The latter consists of pyocyanin, and is formed synthetically from the albuminous bodies contained in pus and skin secretions, or rather from the products of their decomposition, *i. e.*, fatty acids, carbohydrates in the presence of phosphates, magnesium, and sulphur. Chromogenesis is also observed on artificial media containing these substances.

MUEHLECK.

Experiments on Immunization against Staphylococcus Pyogenes Aureus. (*Beiträge zur klin. Chirurgie*, Vol. XVIII., No. 1, 1897.) By Ludwig Reichenbach, M.D.

In this article a *résumé* of the literature is given, together with the results of three series of experiments conducted in Professor Czerny's surgical laboratory at Heidelberg. Bouillon cultures of the staphylococcus were sterilized at a temperature of 53–55° C., but were found to be toxic only to a mild degree; they were therefore evaporated in the exsiccator at a temperature of 30–40° C. to about one-tenth their volume. The minimum fatal dose for rabbits was now found to be from 8 to 10 c. c. The first

series of experiments proved beyond doubt that in this manner rabbits may be rendered either partially or totally immune against a certain fatal dose of a bouillon culture of this micro-organism. The second series of experiments were made in order to test the immunizing power of serums taken from animals so injected. The serum was obtained from blood taken from the femoral vein or artery under antiseptic precautions. It was allowed to stand for 24 hours in an ice-chest and cleared in the centrifuge. The injections were almost always made immediately before those of the culture. Animals so treated survived longer than control animals and some remained alive after having received two or three times the fatal dose; in other cases the serums proved to be inert or even positively harmful. The immunizing power of the serum seems to depend largely upon the interval of time between the injection of the culture and the bleeding of the animal for the serum. Serum from animals injected two days before was almost inert, also that of an animal injected 36 hours before. On the other hand, the same animal produced a very active serum after having been injected again a short time previously. The quantity of sterilized culture injected and the duration and method of treatment seemed to have no influence on the efficacy of the serum, nor could any relation between the immunizing power of the latter and changes of weight in the animal be noted. The third series of experiments, with the serum of non-immunized animals, gave negative results. It was incidentally noticed that mice, which had previously been injected by pyogenes aureus cultures of the *Staphylococcus pyogenes aureus* were much more resistant against infection. Although the series of experiments are too short to admit of definite conclusions, the author considers them sufficiently encouraging to continue the work.

MUEHLECK.

Experimental Production of Fat Necrosis—Fat Necrosis about the Pancreas of the Hog. (*Boston Medical and Surgical Journal*, April 15, 1897.) By Herbert N. Williams, M.D.

Any experiments leading to a more perfect knowledge of the causation of pancreatic disease possess an added value by reason of the general obscurity that covers disease of this important organ; and it seems to us that the time is not far off when many clinical symptoms now quite misunderstood will be properly referred to the pancreas; and as our knowledge of its pathological conditions grows and filters through us to the eagerly waiting public, pancreatic disease, unknown, even by name, to the laity, only a few years ago, will become more frequent, as they find themselves possessors of a large, important, and, to them, virgin organ. It seems equally possible also that their long ignorance of its existence may in the past have done much to keep them free from pancreatic disease. In regard to fatty necroses of the pancreas, many more cases occur than is generally known. Rarely, if ever, diagnosed before death, only autopsy,

by skilled hands, reveals the real mischief, and, undoubtedly, fatal cases have been continually occurring, and have slept their final sleep just as peacefully under a mistaken diagnosis. Dr. Williams has in these experiments devoted himself mainly to verifying the conclusions of Hildebrand. He is an experienced investigator, has done his work carefully, and his results are of much value for the future. Dr. Williams also gives the results of his examination of the pancreas in one hundred hogs, made to determine whether American hogs are subject to fatty necrosis in the same percentage that is found by continental observers. The animals examined came from various States, and fat necrosis was found in two out of the one hundred examined. Balser, however, found it "in nearly all Hungarian, frequently in Algerian, and in a few German swine."

EDWARD WILLARD WATSON.

Researches into the Cause of Cattle Plague. (*British Medical Journal*, May 15, 1897. Special Report.) By R. Koch.

Rinderpest is an inflammatory affection of nearly all the mucous membranes, characterized by congestion of the small vessels and capillaries and by capillary hemorrhages into the tissue. Later on the epithelium becomes desquamated and profuse serous desquamations occur, with the formation of pseudo-diphtheritic infiltrations, partial necroses, and deep ulcerations. The disease should be classified among the exanthemata. Inoculation of healthy animals was made by injecting ten c. c. of the defibrinated blood of a diseased one on the second or third day after the rise of temperature. In this way a typical attack of rinderpest was uniformly produced, beginning three or four days after the inoculation and ending fatally on the sixth or seventh day after the rise of temperature. An ox which does not fall ill after such an injection of rinderpest blood must be immune against the infection. This conclusion affords the basis for all future investigation.

SWAN.

I. Puerperal Sepsis due to Infection with Bacillus Aërogenes Capsulatus. (*Bulletin of the Johns Hopkins Hospital*, February, 1897.) By George W. Dobbin, M.D., of Baltimore.

II. Report of Five Cases of Infection by the Bacillus Aërogenes Capsulatus. (*Ibid*, April, 1897.) By Edward K. Dunham, M.D., of New York.

I. Dobbin saw the patient after she had been in labor for two days under the care of a midwife. After the delivery by forceps there was an escape of gas, with an explosive sound, from the uterine cavity. The gas had a sickening, fetid odor. The child was stillborn. The mother died, and almost immediately the body commenced to swell. Subcutaneous emphysema developed. No autopsy was allowed. The gas bacillus, described by Welch and Nuttall, was found in the placenta and in the tissues of the

fetus, which commenced to swell soon after delivery. The larger vessels of the chorion were plugged by emboli of bacilli, and in some places "gas cysts" were found in them. The writer reports five similar cases that he has collected from the literature.

II. Dunham reports five cases of infection by this bacillus. The first was an abscess originating in the left tonsil, the second infection following a compound fracture of the humerus. Two of the remaining were patients upon whom external urethrotomy had been performed, and in the last infection appeared to take place through a false passage in the urethra. The symptoms were those of profound sepsis and rapidly spreading pus formation with subcutaneous emphysema. In all the cases an anaërobic gas bacillus was found identical with the bacillus described by Welch and Nuttall. The bacteriological examination was very thoroughly conducted, and invariably the bacteria proved pathogenic to guinea-pigs, with characteristic gas formations in the animals' tissues. In two of the urethral cases the bacillus was associated with the colon bacillus. STEELE.

A Modification of Heller's Method of Staining Medullated Nerve Fibres. (*British Medical Journal*, March 13, 1897.) By W. Ford Robertson, M.D., of the Royal Edinburgh Asylum.

The writer hardens the nervous tissue in the chrome-alum-copper fluid used in Weigert's methods for staining neuroglia. This consists of chrome alum, two and one-half per cent.; copper acetate, five per cent.; acetic acid, five per cent.; and formalin, ten per cent. Robertson reduces the amount of formalin to two per cent., as it has been found that the larger amount prevents the staining of the chromatic granules of the nerve cells. The tissues remain in this fluid ten days or longer. They are then washed in water, embedded in celloidin, and cut. Stain in one per cent. osmic acid solution for half an hour (in the dark), then in five per cent. pyrogallic acid solution for half an hour, then for three or four minutes in one-fourth per cent. potassium permanganate (brain sections not more than one minute), wash thoroughly, and mount in balsam. The result is as satisfactory as the Weigert-Pal method and quicker. The normal fibres are a deep black and areas of degeneration are very clearly shown. The sections can be counterstained best with hematoxylin. The ganglion cells retain their shape well, but stain only fairly, probably because most of Robertson's work has been done with the stronger formalin solution. STEELE.

PEDIATRICS.

A Study of the Blood in Rickets. (*Boston Medical and Surgical Journal, 1897.*) By John Lovett Morse, M.D.

Morse examined the blood in twenty cases of uncomplicated rickets in infants under two years. The blood was obtained from the lobe of the ear

and examined with the Thoma-Zeiss apparatus. It was diluted (1-200) with a 3 % salt solution colored with methylene blue. He counted the red corpuscles in one-tenth of a cubic millimetre and the white corpuscles in two cubic millimetres. The hemoglobin was estimated with the von Fleischl instrument. Cover slips were made and hardened in equal parts of alcohol and ether, and stained with Ehrlich's triple stain. A differential count of 500 white blood corpuscles was made, Ehrlich's classification being used. The blood was usually examined about noon and about three hours after food had been taken. The cases were divided into three groups: 1. Those in which the manifestations were mild. 2. Those in which they were more severe, but without enlargement of the spleen. 3. Those in which there was splenic tumor. There were nine cases of the first class, four of the second, and seven of the third. The hemoglobin was always diminished but always proportionately greater than the red corpuscles. Leucocytosis existed in a little more than half the cases. It was more frequent in cases with enlarged spleen than in those without, and its degree was independent of the presence or absence or of the size of the splenic tumor. The histological changes in the red corpuscles increased, as a rule, with the severity of the case, being most marked in those with enlarged spleen. The average of the different forms of leucocytes in the nine cases without leucocytosis gave the following proportions: small mononuclears 43 %, large mononuclears 8 %, polynuclear neutrophiles 47 %, polynuclear eosinophiles 2 %. The average proportion in the eleven cases with leucocytosis, including the six cases with enlarged spleen, was, small mononuclears 45 %, large mononuclears 5 to 6 %, polynuclear neutrophiles 45 %, polynuclear eosinophiles 4 to 5 %. There existed nucleated red corpuscles and moderate poikilocytosis. On the basis of these results, in connection with the results of other observers, he concludes that most cases of rickets are accompanied by an anemia which may be of any form and of any degree of intensity, the latter depending generally upon the severity of the process. The most common form is that in which the number of red blood corpuscles is normal or nearly so, and the percentage of hemoglobin absolutely and relatively diminished. Leucocytosis may or may not be present. It is most frequent in cases with enlarged spleen. Any or all the varieties of leucocytes may be increased. The specific gravity of the blood varies with the amount of hemoglobin. There is no special form of anemia in rickets.

S. M. Hamill.

Extensive Subcutaneous Emphysema Complicating Diphtheria. (*Lancet*, April 3, 1897.) By J. Schutz Sharman, M.R.C.S. Eng., and D. d'Esterre, M.D., M.R.C.S. Eng.

The case reported was one of great severity from its beginning. On the fifth day subcutaneous emphysema occurred at the base of the neck, giving rise to tumors above the sternal end of each clavicle. The follow-

ing day the emphysema spread upward to the submaxillary regions and downward over the chest. Within a few days air could be felt under the skin of the entire trunk, especially on the right side. The right half of the scrotum was much inflated and quite transparent. Before death the emphysema had reached the zygomatic regions above and Poupart's ligaments below, the scrotum in front, the iliac crests laterally, and the margins of the coccyx and sacrum posteriorly. The autopsy was limited to the neck; there was no ulceration or perforation of the trachea to account for the emphysema, and in the absence of a complete post-mortem the authors conclude that the emphysema occurred through a ruptured air vessel, the air escaping into the adjacent mediastinal tissues and thence to the neck and trunk.

S. M. Hamill.

Diphtheria of the Umbilicus. (*Lancet*, April 3, 1897.) By Bernard Pitts, F.R.C.S. Eng.

The case occurred in a child fourteen days of age. The mother and a brother were ill with diphtheria. The cord separated on the eighth day. There was a brawny red indurated area, devoid of epidermis and about the size of a five-shilling piece, surrounding the umbilicus. The wound continued to discharge offensive pus, and there was an opening about one inch in depth in the sloughing umbilicus. The child's condition was good. There were an occasional inspiratory crow and a slight cyanosis. The Klebs-Loeffler bacillus was discovered in the pus escaping from the umbilicus. The child gradually weakened and died within two days. Examination after death showed larynx and pharynx normal. The local lesion had not extended to other organs.

S. M. Hamill.

OBSTETRICS AND GYNECOLOGY.

The Use of Injections of Artificial Serum during and after Post-partum Hemorrhage. (*L'Obstétrique*, January, 1897.) By Ad. Olivier, M.D.

After discussing the various formulas for the serum, Olivier gives the preference to one containing ten grammes of sodium chloride to the litre of water, sterilized in an autoclave if possible, but in emergencies made of boiled water cooled to a temperature of 40° C. (104° F.) or a little lower. Although the effect upon arterial pressure may be as rapid when small quantities of serum are injected subcutaneously as when they are thrown directly into a vein, still the intravenous method is to be employed in serious cases, requiring, as they do, one-half to two litres in the shortest possible time. In grave cases with threatened death inject one and one-half to two litres directly into the vein; in less urgent cases inject 200 c.c.

or so into the loose connective tissue beneath the skin of the buttocks or abdominal wall. Rectal enemas of saline solution to which a few drops of laudanum have been added to allay irritation should be tried either alone or concurrently with the other methods. In order that the accoucheur may have a convenient apparatus always ready for an emergency, the author has devised a small case containing a simple apparatus for intravenous injections, by which a siphon can be formed with any ordinary pint or quart bottle, and also an especially simple form of sterilizable syringe of 200 c. c. capacity for the subcutaneous injections. For sudden emergencies a flask holding 500 c. c. of sterilized serum is kept prepared. It is surrounded by a removable felt jacket and protected by a metal case which may be used as a water-bath in heating the serum. Renal complications are the only contra-indications to the use of large intravenous injections. In cases of grave albuminuria small successive doses should be tried.

L. S. Smith.

Uterine Inertia in the Induction of Labor. Inefficacy of the Methods of Inciting Labor. A New Excito-Dilator of the Cervix. (*L'Obstétrique*, January, 1897.) By Charles Lucas.

In certain rare cases, owing to an inertia of some sort, the uterus resists all efforts to excite its contractions, to the surprise and embarrassment of the accoucheur and at the risk of infection to the mother and of death to the child. The author reviews seven cases recently published and reports two new ones in which various attempts to induce labor by bougies and dilators of different kinds were most unsatisfactory. A description follows of the construction and mode of action of the elastic bags of which the Tarnier is the type, of the inelastic ones of the Champetier de Ribes type, and of the cervical dilator of Tarnier. The most effectual excito-dilator is the bag of Champetier, but its size and large rounded convex upper extremity are apt to displace the presenting part too much and give rise to malpositions. To obviate this, Lucas has devised a bag of the same inelastic material but of a different shape. When fully distended it has the form of two truncated cones, one three times the height of the other, joined at their smaller ends, thus bringing the narrowest part of the bag at their point of union one-fourth of the distance from the lower end. The height of the bag is 10 cm., and the diameter of the outer faces, the two ends, is 9 cm. The centres of these two faces are joined by a silver wire whose length is shorter than the height of the bag, so that when the bag is distended the centres of the ends are depressed and the surfaces are concave. For introduction into the cervix the bag is rolled up lengthwise and fastened with an elastic band whose ends are either tied or held by a hemostat. The bag, in this long slender shape, may then be introduced by means of any ordinary curved forceps, and when in position lies with its upper three-fourths in the

lower uterine segment and cervical canal and its lower fourth in the vagina. The ends of the rubber bands are then loosened, and the bag is slowly distended with water drop by drop under thirty pounds' pressure from the Équisier irrigator No. 3.

L. S. Smith.

Deaths after Ovariotomy, with Remarks on the Value of Flushing without Subsequent Drainage of the Peritoneal Cavity. (*Lancet*, June 5, 1897.) By W. A. Meredith, M.B.

The author briefly reports seven fatal cases in a series of 250 operations for the removal of ovarian tumors,—a mortality of only 2.8 %. Four of these deaths were due to kidney disease, one to pneumonia, one to shock, and one, a unique case, was due to hemorrhage from rupture of an old pyloric ulcer. There were no fatalities from sepsis, but three of the fatal cases were ovarian cysts which had undergone torsion of the pedicle. Of the other 243 cases 84 % never had a temperature above 100.5° F. and only two cases reached 103° F. He attributes these good results and the comparative ease and shortness of recovery largely to flushing of the peritoneal cavity without subsequent drainage and leaving a part of the water in the cavity. For this method he claims the following advantages: first, the water by its temperature prevents venous oozing or formation of clots; second, by its solvent action it promotes absorption; third, by dilution it facilitates the absorption of any remaining fluids; fourth, by this rapid absorption the urinary secretion is freely promoted; fifth, by its mere bulk as a mechanical agent it assists in restoring the balance of intraperitoneal pressure and so promoting the recovery from shock; sixth, by natural gravitation into the pelvis it tends to displace the intestines and prevent the formation of adhesions in this situation; seventh, by affording a liquid medium through the peritoneal cavity it diminishes friction and consequent irritation between opposed serous surfaces, thereby lessening pain, averting the risk of adhesions, and generally promoting ease and smoothness of recovery. He adds that this method is contra-indicated in cases complicated by intraperitoneal sepsis at the time of operation.

Girvin.

A Plea for the Larger Use of Ergot in Obstetrics. (*Lancet*, May 29, 1897.) By Thomas More Madden, M.D., of Dublin.

From the use of ergot in 150 labor cases, before, during, and after delivery, Madden deduces the following rules: (1) the presentation should be cranial, except some breech presentations with uterine inertia; (2) there should be no marked disproportion between fetus and mother or any other physical impediment to delivery; (3) the os uteri should be fully dilated, or so dilatable as to allow of speedy delivery by the forceps if the child be not expelled by uterine action within one hour of its administration; (4) the preparation selected, the dose, and the method employed

should be well calculated to produce the required effect. If used otherwise at least 25 % are stillborn. Subject to these rules he urges the larger use of ergot in the following conditions: (1) before dilatation in a dilatable os in some cases of uterine inertia where there is imminent danger to mother or child, or when there is risk of subsequent flooding from further protraction of the case; (2) during the second stage in abnormally tedious labor from deficient uterine action or otherwise complicated, where the presentation is normal and no other impediments to delivery exist, and for the prophylaxis of apparently impending flooding; (3) in the third stage for expulsion of placenta when retained from inertia, or for the arrest of hemorrhage; (4) after delivery it may be used immediately to check or prevent hemorrhage or subsequently to produce tonic and permanent contraction and, by sealing up vessels, to lessen danger of sepsis, or for expelling clots from the uterus and so arresting after-pains; (5) lastly, in the majority of multiparæ it may be used during the puerperium to stimulate muscular tonicity, hasten involution, and obviate the possibility of future chronic subinvolution. He insists that it should be used "in the form and dose best calculated to produce firm, regular, and tonic uterine contraction, which alone will secure the desired result, and never in the small, inefficient, and frequently repeated doses which produce only irregular and evanescent waves." He advises using the fluid extract in two or three drachm doses by the mouth, at the same time giving one or two drachms by deep hypodermic injection.

GIRVIN.

Fibroma of the Ovary and Ovarian Ligament, with Pathological and Clinical Reports of a Series of Eight Cases of Fibroma of the Ovary and One of the Ovarian Ligament, Treated by Operation. (*British Medical Journal*, May 1, 1897.) By H. Briggs, M.B.

In 1870 Martin removed a hard fibrous tumor of the ovary and could refer to only two other cases. Leopold, in 1876, collected 59 cases of solid ovarian tumor, of which nineteen were described by their authors as fibromata, some of which were probably sarcomata. When spindle or mixed cells have been conspicuous in the structure, sarcoma has been the verdict, but Briggs thinks wrongly, from the clinical reports. He reports eight cases, all but one of which were unilateral, none of which were associated with fibroid growths of uterus, and all of which were well some time after operation. Ascites was noted in five cases, pain in four, and uterine enlargement in three. Mucoid degeneration had taken place in one case and calcification in one. He concludes that the evidence is in favor of fibroma in all heavy solid primary ovarian growths. He adds the report of a case of fibroma of the right ovarian ligament to the three previously reported cases of that rare condition.

GIRVIN.

Avulsion of the Uterus. (*Lancet*, June 5, 1897.) By E. Hickson Smith, M.R.C.S.

A midwife who was in attendance upon this case, mistaking a mass which came down after the birth of the child for a second head, succeeded in removing it after severe traction for forty-five minutes. Upon examination this proved to be the uterus and cervix, with one broad ligament and Fallopian tube, but no ovary (the other broad ligament was congenitally absent). The woman suffered from shock, and a vaginal examination showed the coils of intestine in the upper part of the vagina, but there was not severe hemorrhage, and the woman made a good recovery, being up and about in three weeks. A later examination showed the top of the vagina cicatrized over and the vagina a cul-de-sac.

GIRVIN.

Anatomical Investigation in Regard to the Alexander-Kocher Operation. (*Monatschrift f. Geburtshülfe u. Gynäkologie*, March, 1897.) By Oscar Beuttner, M.D.

Heretofore three factors have prevented Alexander's operation from becoming popular,—namely, not infrequent recurrence, the fear that at the operation the round ligaments might not be found, and the great importance attributed to vaginal fixation. Since Kocher's recommendation to stitch the ligaments drawn out of the opened inguinal canal to the fascia of the external oblique in the direction of the anterior superior spines of the ilium, recurrences have become rare, and, as the poor results of vaginal fixations have become experienced, the Alexander's operation has obtained a firmer footing, and the question has been asked whether there are cases in which the ligaments cannot be found. The author, to convince himself of the condition and topographical anatomy of the round ligaments, performed the operation twenty-four times on twelve cadavers, with the result that out of twenty-two cases the external ring was found easily in fourteen, with difficulty in five, and not at all in three. The size of the ligament is so much smaller after it has passed out of the external ring that in many cases it was difficult to discover it at all in that position. So he states that "in performing the Alexander's operation the round ligaments must be sought for, either at the internal ring or in the inguinal canal." The greatest thickness of the cord at its exit from the internal ring was 2.7 mm., the least 1.7 mm., the average 2.3 mm. The thickness decreases towards the symphysis pubis. The greatest distance of the round ligament from Poupart's ligament as it passes out of the internal ring was 15 mm., the shortest was 8 mm. At a point midway between the internal ring and the middle of the symphysis pubis the round ligament had a maximum separation from the Poupart's ligament of 12 mm. and a minimum one of 2–3 mm. In cadavers in which no pathological condition interfered with attempts to draw out the round ligaments, the distance to which they

could be drawn ranged from 12 cm. to 5.5 cm. There was as much as 2 cm. difference between the lengths of the ligaments in the same cadaver. The presence or absence of prolapse as a complication of the retroflexion should make no difference in regard to the direction in which the ligaments should be stitched. "In performing the Alexander's operation the round ligaments must, as Kocher has proposed, always be fastened upward, that is, towards the anterior superior spines."

L. S. Smith.

BOOK REVIEWS.

Anatomical Atlas of Obstetric Diagnosis and Treatment. By Oscar Schaeffer, M.D. With 145 Illustrations. New York: William Wood & Co. 1896.

The author of this excellent atlas states that this volume deals with the morphology of the female pelvic organs, as the anatomical basis of the physiological and pathological phenomena of pregnancy and labor. The normal and abnormal processes of pregnancy and of the mechanism of labor are explained by the morphological conditions, and from the latter are deduced the diagnostic points and the indications for treatment. The first fifty-six pages are exclusively given to one hundred and forty-five colored illustrations, embracing the subjects of pelvic deformity, pelvimetry, and to some extent the mechanism of labor, abdominal palpation, and the pathological changes in the ovum. Many of the illustrations are excellent. The space given to pelvic deformity is very great, and other topics equally important are not so profusely illustrated.

The text of the book comprises about one hundred and seventy-five pages, in which are chapters on the normal anatomy of the sexual organs during pregnancy; pelvic deformities and their influence upon pregnancy and labor; displacements, tumors, and anomalies of development of the sexual apparatus, and their influence upon pregnancy and labor; rupture of the uterus; extra-uterine pregnancy and placenta prævia; anatomy and etiology of premature expulsion of the ovum; abnormal presentations, and abnormal states of the funis; labor complicated by abnormal uterine contractions and by general diseases of the mother; obstetric therapeutics, technical, medicinal, and surgical. In addition to the value of the illustrations, the text is concisely written and contains the kernel of modern practical obstetrics. This atlas will therefore prove a valuable adjunct to the more comprehensive text-books of obstetrics.

R. C. N.

The Principles of Bacteriology. By A. C. Abbott, M.D. Third Edition. Philadelphia: Lea Brothers & Co. 1896.

This book is unquestionably a success, and deservedly so, because of the thoroughness with which the work has been done, and the effort, obvious in each successive edition, to improve the old and include all that is essential of the new. No attempt has been made to include descriptions of all the pathogenic bacteria. To some, including ourselves, it seems that, perhaps, more fulness in this respect would have been not undesirable. Particularly would we have liked to see a description of the bacillus of influenza. Nevertheless, it is hardly fair

to criticise an author for not accomplishing what he did not set out to do. The illustrations are fair: although they can hardly be said to be perfect, they are quite adequate for a laboratory hand-book. The style is noticeably good; bad English is a fault altogether too common at present in American medical literature. It is hardly necessary to recommend the book, that having been accomplished by the previous editions; but we feel that it is an important addition to the bacteriological literature of America.

J. S.

The Eye as an Aid in General Diagnosis: A Hand-Book for the Use of Students and General Practitioners. By E. H. Linnell, M.D. 8vo, pp. 248. Philadelphia: The Edwards and Docker Co. 1897.

Careful examination of the subject matter in this volume shows that the author's purpose, to present sufficient ophthalmic data for the student and general practitioner better to understand constitutional diseases, has been accomplished.

A most excellent and logical division of the symptomatology, embracing the entire field of study in as brief, yet fully expressed, terms as possible; a thorough exposition of the significance of the various ocular signs; enough anatomy to render the subject-matter plain and understandable; and sufficient pathology for the proper elucidation of the etiological factors at work in the production of both the local and general disturbance; all have received the conscientious thought of the author.

An extensive and intelligent reading of the books of others, and an individual experience of two decades' duration in clinical studies directed in the same channels, make the contained references and findings almost invaluable.

From an intimate personal knowledge of the subject, the reviewer does not hesitate to recommend the book as a most excellent guide and a valuable companion to those who aim to obtain proper information regarding the ocular symptomatology of disease.

C. A. O.

Reference Book of Practical Therapeutics. By Various Authors. Edited by Frank P. Foster, M.D. In Two Volumes: Vol. I. New York: D. Appleton & Co. 1896.

This work will doubtless be gladly welcomed by the busy practitioner as an up-to-date record of therapeutics, presented by writers more or less identified with the subjects upon which they treat. Indeed, many of the articles are so thorough as apparently to curtail the necessity for special monographs on the same subject.

The article on condensed or rarefied air, by Dr. S. Solis-Cohen, cannot fail to attract the attention of the reader to the opportunities offered in suitable cases by these methods, which are certainly more generally appreciated in Europe than in this country.

Dr. J. T. Eskridge presents us with a well-written article on animal extracts and juices. It would seem, however, that undue consideration has been allotted to the subject of the testicular liquid, whose chief merit consists in having attracted attention to other and more meritorious glandular products.

The question of climatic treatment, by Dr. Charles Denison, is an apt *résumé* of our knowledge upon this subject, which will doubtless be more closely studied in the future.

The subject of electricity, by Dr. Frederick Peterson, is interestingly presented, but we are surprised that, in describing the method to be used for the

resuscitation of persons apparently killed by electric shock, credit is not given to the originator, Dr. Laborde, of Paris.

Exercise, by Dr. Henry L. Taylor, is of value, especially as the tendency of the masses in this direction is a matter of popular comment. It is particularly for this reason that more consideration could justly have been given to the injurious results attending over-exertion in this connection.

Dr. J. T. Eskridge devotes considerable space to the question of hypnotism, and observes that the foreign element of our population is more easily hypnotized than the native-born American. This statement would seem to be an absolute necessity to enable us to accept many of the foreign reports on this subject.

Many other meritorious articles might be mentioned if lack of space did not forbid. The index of diseases has been carefully drawn up, and the general appearance of the book is excellent.

It would, in our estimation, have been wiser, however, to have omitted the consideration of at least those proprietary preparations the composition of which remains a matter of conjecture.

J. M. A.

Disorders of Digestion in Infancy and Childhood. By W. Soltau Fenwick, M.D., B.S., London; Member of the Royal College of Physicians; Physician to Out-Patients at the Evelina Hospital for Sick Children, etc. London: H. K. Lewis. 1897.

The digestive disorders in children preponderate so largely over all the other diseases of early life that there is abundant reason for considering them in a separate volume. Dr. Fenwick has done this in a manner worthy of commendation. The book before us shows that the very large amount of clinical material at his command has been studied with intelligence and painstaking conscientiousness. The first chapter, devoted to the anatomy and physiology of the stomach in infancy, is not made up merely of the usual rehash of the text-books on those subjects, but under the head of physiology the author embodies the results of numerous experiments some of which are at once of scientific value and practical importance. From these it appears that the average total acidity of the filtered stomach contents tested eighty minutes after taking food is much higher in children fed on cow's milk than in those which are nursed at the breast, while in infants fed on farinaceous foods the total acidity is invariably diminished and may not exceed one-half the normal. Other observations by the author as to gastric motility in children indicate that the stomachs of breast-fed infants are, on the average, emptied in one and a half hours, while those of infants fed on cow's milk are not emptied in less than from two to two and a quarter hours. These last observations, however, are open to question, since the wholly unreliable and exploded salol test seems to have been the one most relied upon.

The second chapter, on Diet in Infancy, the third, on the Dyspeptic Conditions of Infancy, and the fourth and fifth, on the Acute and Chronic Gastro-Intestinal Catarrhs in Infants, accord in the main with the best modern teaching. The remainder of the book comprises chapters on the more usual dyspeptic ailments of older children, including acute and chronic gastric catarrh, weak digestion, ulceration, paroxysmal hyperacidity, and indigestion dependent upon other forms of disease. The discussion of these various subdivisions is, in the main, fully abreast of the times, though in treating of hyperacidity and elsewhere in explaining the methods of testing for acidity the author gives evidence of having confined his study of German and French treatises on diseases of the

digestive organs too exclusively to those few which have been translated into English, and these no longer represent the most advanced discoveries in this field. He seems to have limited his quantitative work mainly to estimations of the total acidity by titrating with the usual soda solution, and to have assumed that the result represented only or almost entirely hydrochloric acid. This is a wholly erroneous assumption, since a slight amount of free hydrochloric acid is not incompatible with the presence of an enormous excess of organic acids.

No reference is made to the value of systematic abdominal massage in the treatment of the dyspeptic and catarrhal affections of children, though there is a passing suggestion that rubbing the colon may help to relieve colic in infants. Massage is of such great usefulness at all ages, especially in ailments associated with constipation, that it should not have been overlooked.

Under the proper pathological title of Chronic Gastro-Intestinal Catarrh is very satisfactorily considered that most prevalent affection of infancy and early childhood, which in the text-books of the past has masqueraded under so many different aliases, from "summer complaint" to "inflammatory diarrhea." Indeed, it is interesting to find that the author's studies and teachings tend strongly to confirm the view, now coming more and more into prominence, that dyspeptic disorders generally have an organic basis, the lesion being most commonly a catarrhal process. He states, on page 265, that in 73 per cent. of his own cases "the symptoms of weak digestion had either followed immediately upon an attack of acute inflammation of the mucous membrane of the stomach, or had gradually developed from the subacute form of the complaint."

The mechanical execution of the book leaves nothing to be desired.

B. R.

THE DISEASES OF THE STOMACH. By C. A. Ewald, Extraordinary Professor at the University of Berlin, etc. Translated and edited, with Numerous Additions, from the Third German Edition, by Morris Manges, A.M., M.D., Assistant Visiting Physician to Mt. Sinai Hospital; Lecturer on General Medicine at the New York Polyclinic, etc. Second Revised Edition. New York: D. Appleton & Co. 1897.

The last German edition of this work is so well known to many of the profession that a detailed consideration of it is superfluous. Presenting a large mass of knowledge in many ways very instructively, its most evident fault is the imperfect system in arrangement, which places many of the methods of examination, chemical and physical, in the preliminary chapters, and distributes the remainder among the portions on diagnosis of numerous diseases, and, in like manner, divides the general treatment of the physiology of the stomach and of the pathological process consequent upon deviations from normal digestion into incomplete parts,—in the opening chapters, the chapter on gastritis, and the formally physiological chapter, by the author's brother, which latter appears only after the organic diseases have been disposed of. A tendency to discursiveness and polemic in the discussion of some of the author's own views and methods, and the retention of some of these which had not, at the time of writing, passed further proving unscathed, conspires, with an occasionally excessive use of space in reporting cases, to rob the whole of that crispness and clearness to be expected of so able an investigator. In other points the various chapters are, in the main, logical and complete, and exhibit everywhere his erudition and wide experience. Wide changes in views and multitudinous additions to the literature since the appearance of the last German edition of the work make the task of editing a translation a heavy one, and its utility is ques-

tionable, since the endeavor to rejuvenate a book by annotation must result in some confusion.

The editor has made a very complete collection of the important literature of recent years, the inclusions being somewhat too generous; as, for example, some of the recent works on the etiology of gastritis might have been freely cut and the claims of lactic acid in cancer reduced somewhat.

The translation is charmingly done, and the illustrations introduced by the editor are much better than most of those which have been taken from the original.

EDSALL.

A HAND-BOOK OF MEDICAL CLIMATOLOGY. By S. Edwin Solly, M.D., late President of the American Climatological Association. Philadelphia and New York: Lea Brothers & Co. 1897. 8vo, pp. 470. Price, $4.00.

Dr. Solly's book treats of the general principles of climate and their therapeutic application, and, although affording data as to the chief health resorts of the world, deals chiefly with North America. Since the first publication by Drake and Blodget half a century ago, an immense amount of valuable data respecting meteorology and climate has accumulated, and the later investigations, to which the United States Government and the American Climatological Association have so greatly contributed, have been waiting for just such an accomplished author as Dr. Solly to present them in some available shape for the practitioner of medicine. A treatise on this subject was announced by a well-known author ten years ago, but it proved to be a case of "*montes parturiunt*" and is yet undelivered. How well Dr. Solly has accomplished the difficult task is quickly seen.

The first section of the book is devoted to a broad consideration of the underlying principles of medical climatology, physiology, ethnology, and the geographical distribution of disease, and to the classification of climates; in the second section the different diseases affected by climate are considered; and in the third section, the various regions of the world which are available as health resorts.

A number of handsome plates and relief maps add to the value of the book. Naturally the subject of phthisis claims a large share of the author's attention. He states that cases of phthisis without tuberculosis, or those in which the tubercle bacillus cannot be discovered, are doubtless in most instances caused by some other micro-organism; on the other hand, he holds that it is possible, and indeed probable, that the bacillus can, and occasionally does, exist in the body without tuberculosis, *i. e.*, without becoming the centre of a globule of peculiarly degenerated lymph, and so forming a tubercle and causing tuberculosis. This general subject is quite fully unfolded.

Great pains has been taken to give accurate and unbiased opinions as to health resorts. The statements made are remarkably accurate. The Rocky Mountain region comes in for the lion's share, and naturally, as it is *par excellence* the climate for the consumptive. Much valuable information is also given as to the climates of the Pacific slope. We find that even Hawaii is not neglected. Honolulu, on the southern shore of the island of Oahi, is described as a city of broad, clean streets, lined with beautiful homes, many churches, a theatre, street railways, electric lights, telephones, and a town water system, besides artesian wells. The soil is of volcanic nature and fertile when well watered. At Waikiki, a seaside resort a few miles east of Honolulu, there is fine surf bathing, with a hotel and a shore lined with villas and cottages. The

lowest record of temperature at Honolulu for ten years was 54° F., and the highest 89° F. The average midday maximum is about 80° F.; annual rainfall, about thirty-seven inches. The island of Hawaii is two hundred miles distant from Honolulu, and its volcanic peaks rise to the height of fourteen thousand feet. At Hilo the rainfall is said to reach 144 inches a year. As a book of reference this work will be welcomed by the profession.

G. H.

Medical and Surgical Report of the Presbyterian Hospital in the City of New York. Vol. II., January, 1897. Edited by Andrew J. McCosh, M.D., and Walter B. James, M.D. 4to, pp. 272.

This report contains twenty-five papers contributed by the various members of the staff, many of whose names are well known in medical literature.

The best paper is that on renal tuberculosis, by Dr. F. Tilden Brown. The author is a firm believer in climatic treatment for this condition, and advises, in the summer, camp-life in the Adirondacks or Canadian altitudes, living in a well-ventilated log-cabin, sleeping in loose, light flannel garments; internally the use of creosote in gradually increasing doses until seventy or eighty minims daily are taken. The pine regions of the South are advised for the winter. The author states that better results are obtained in this way, as a rule, than by nephrectomy.

Two papers on cold bathing in typhoid fever are contributed by Dr. W. Gilman Thompson and Dr. J. P. Thornley. Statistics of two hundred cases are given. Of the twenty-five cases received before the end of the first week two died; of eighty-two received in the second week eight died; of twenty-five cases received in the third week four died. Relapses occurred in thirteen and a half per cent. The use of cold tub-bathing was not found ordinarily to shorten the duration of the fever or to diminish its complications. After summing up the advantages and disadvantages of the plan of treatment, Dr. Thompson decides that the benefits outweigh the objections.

Dr. Forbes Hawkes reports sixty-six cases of appendicitis treated by Dr. A. J. McCosh in two years' service. Of these fifty-seven were operated upon. Of forty-six cases operated upon before general peritonitis developed, one died. Of eleven complicated with general septic peritonitis, nine were operated upon and six died. The youngest was five and the oldest fifty years of age.

G. H.

A Practical Treatise on Diseases of the Skin, for the Use of Students and Practitioners. Fourth and Revised Edition. By James Nevins Hyde, A.M., M.D., Professor of Skin and Venereal Diseases, Rush Medical College, Chicago; and Frank H. Montgomery, Lecturer on Dermatology and Genito-Urinary Diseases, Rush Medical College, Chicago. Illustrated with 110 engravings and 12 plates in colors and monochrome. Pp. 808. Philadelphia and New York: Lea Brothers & Co. 1897.

In this, the fourth edition of Dr. Hyde's well and favorably known treatise on dermatology, we notice many additions which embody the latest advances in cutaneous medicine, adding materially to the value of the work as a text-book and as a book of reference for the practitioner. Hydrocystoma, erysipeloid, conglomerative pustular perifolliculitis, eczema folliculorum, and protozoan disease are some of the new subjects treated; and many of the older chapters show the addition of new material wherever this has been made necessary by recent advances.

In the section upon conglomerative pustular perifolliculitis the cause is said to be contagion, but no reference is made to the particular sort of organism concerned in its production. Recent cases reported make it probable that some, at least, of the cases of this severe form of follicular inflammation are due to the trichophyton fungus—are, in fact, examples of deep trichophytosis. This view of its etiology would necessarily have an important bearing upon the therapeutics, and account for its most frequent occurrence in those whose occupation brings them into contact with horses and other animals.

We notice that the authors prefer to use the title dermatitis seborrhoïca instead of eczema seborrhoïcum, believing, with Crocker and Elliot, that the disease first described by Duhring as a seborrhea, and later by Unna as a form of eczema, is a dermatitis.

To the article on lichen planus a brief account of the "lichenification" of the French authors has been added, a subject of some importance from a diagnostic and pathological point of view. We infer that the authors are inclined to agree with the French in considering this condition something quite apart from the forms of lichen properly so called.

The elaborate researches of Sabouraud and others concerning the fungi found in the various forms of ringworm are duly considered and their importance is conceded; but the authors state that they have added but little of practical value to our knowledge either in the way of treatment or classification, a statement unfortunately too true. Although researches of this character may not be immediately useful in a practical way, they are of the utmost value in preparing the way for a better understanding of disease and rational and effective therapeutics.

A brief section is devoted to protozoan disease, a subject which a little time ago gave promise of being of considerable importance, not only in dermatology but in general medicine as well. Reference is made to the fact that the bodies found in Darier's disease, Paget's disease, and herpes zoster are no longer regarded as psorosperms, but have been proved to be the result of cell-degeneration. A brief account of the two extremely interesting cases of protozoan disease reported by Rixford and Gilchrist is given.

Altogether this new edition fully maintains the high standard of excellence reached in the earlier ones, and we commend it to those who wish information in this department of medicine as a thoroughly up-to-date, yet properly conservative treatise.

M. B. H.

Clinical Lectures on Mental Diseases. By T. S. Clouston, M.D. Edin., F.R.C.P.E., Physician-Superintendent of the Royal Edinburgh Asylum for the Insane; Lecturer on Mental Diseases in the University of Edinburgh, etc. Fourth Edition. Philadelphia and New York: Lea Brothers & Co. 1897. 4to, pp. 727.

The fourth edition of this highly interesting work perpetuates a large amount of clinical instruction which has been eagerly sought by students of mental disease. The book is so well arranged, and clinical material has been so well incorporated in dealing with the protean aspects of insanity, that one cannot fail to find the volume useful, whether general practitioner or specialist.

The author adheres to a clinical classification of mental disease, trusting to the future for a pathological basis, believing that premature attempts to construct a classification not founded on sound brain physiology and psychology must do more harm than good. The crude suggestions for classifying mental disturbances by means of the vascular and lymphatic changes that can be recog-

nized in some cases, especially in acute insanity, seem to miss the essential relationship of those structures to the neurine. As the author says, "the vessels and lymphatics are the servants of the nerve cells, not their masters, except in rare and exceptional cases. You might as well classify the men and women of a city through the clothes they wear, the houses they dwell in, and the tools they work with."

Apropos of this subject, we would call special attention to the handsome colored plates at the end of the volume, in which pathological alterations of the nerve cells in various forms of mental disease are depicted. The subjects chosen are epilepsy, general paralysis, alcoholic insanity, chronic melancholia, and dementia. These drawings were made by F. W. Robertson, pathologist to the Royal Edinburgh Asylum.

It may be remarked, in passing, that there is in these lectures a wealth of material tending to fortify the position of the defendant in criminal cases in which insanity is alleged as a defence.

G. H.

NOTES AND NOTIONS.

By Order of the Board.

JUST now a wave of disapproval sweeps over our community, and public expectoration hastens to conceal itself from public wrath; but, after all, is there not a word to be said for "the American habit" before it goes its way and is seen no more? Has it done no good? Has it served no useful purpose in all these years during which it has been, as it were, a national institution?

Surely it trains the eye to measure distance and the buccal muscles to habits of precision; possibly even our skill as marksmen in war may owe something to the early training around the stove in the village store. Surely it gives an aim in life, even though that aim be at a cuspidor; and around the fire at night, and at the country station where men and boys await the daily train, everywhere, indeed, where habits of expectoration prevail, the training may be going on that makes us accurate of eye, sure of aim, ready to engage in contests of amiable rivalry without bitterness; and one must be reticent with mouth full of tobacco-juice, and sententious and terse of expression when the cuspidor needs be frequently consulted, so expectoration may even lie at the base of our peculiar American humor.

It is literary, too; it is classical. Did not Dickens and a host of lesser European visitors immortalize it? Even the introduction of the cuspidor has robbed us of something, left us less self-reliant, less imbued with the noble recklessness which characterized the old-time expectorator, to whom the world, the visible universe, was one vast possible receptacle.

Tobacco expectoration is scarcely unhygienic, for the tobacco which kills the aphis and the caterpillar, and which is a burden even to the grasshopper, who is something of a chewer himself, must be inimical to the

lesser germs and carry destruction to microbe life, and bacteriology steps honestly up and corroborates with its dictum the instinctive conclusion of the untaught chewer's heart.

But it is filthy and destroys clothing; yet even here is hope's rainbow, for it trains to carefulness, bids us take heed to our steps, and it promises us for women shorter skirts and stouter shoes for wading.

But surely it is unesthetic. The world must have beauty. Mere grace of design in cuspidors cannot save them: Etruscan, Grecian, Oriental art is not enough to render them endurable. True, we have emerged but recently from the iron and rubber cuspidor age, from the demoniac things that when provoked rose on edge and attacked their innocent victims, whirling swiftly like Ezekiel's wheel—scattering yet still increasing. Progress is rapid: the iron cuspidor supplanted the old sawdust box, just as it supplanted the free, untrammelled universe; and now the art-cuspidor too is doomed.

As the summer days draw on to the autumn and the river runs low and the use of the hose is a prohibited thing, expectoration gives us plays of color, rich golden browns and yellows, deep burnt-sienna and umber tints, in variegated array and unique patterns on the dull monotony of the concrete footwalk and the asphalt road, tints which the old brick sidewalk and the clay and cobble-covered street never knew, for they loved the expectorator and they hid away his results in stealthy absorbent joy. New pavements, new manners, even the eagle eye of the new civic woman, never saw anything wrong till modern invention gave us smooth and white and noiseless roads, and then—and only then—did it become dangerous to expectorate anywhere, "by order of the board."

EDWARD WILLARD WATSON.

Milk Inspection.

A VERY thoughtful article in a morning paper recently illustrates the difficulties of getting proper ideas of hygiene into the public mind. This paper had discovered how necessary and excellent a thing milk inspection is, especially for hospitals, and how an effort was going to be made to supply them with a pure and safe article. And this was to be done by testing the milk in the usual way—seeing that it was rich, unwatered, and unadulterated. Here the inspection stopped. But the real danger, alas, begins just where such inspection ends. No test of specific gravity touches the vital question of the possible conveyance of diphtheria, scarlet fever, typhoid, influenza, dysentery, stomatitis, and cholera infantum. We have omitted tuberculosis because when the milkmen say that their cows have been inspected and give safe milk they allude to tuberculosis alone. They have, some of them, got that far. But even in this they give us but little security, since the milk of cows under suspicion generally goes to market. The real danger lies not in water adulteration or cream robbery, but in the insidious germ that falls from every

wind, that wafts in every dust cloud, and lurks in every draught of drain-laden air, in the damp walls of the pantry and cooling house, in the mould and decay under the creamery floor, in the clothes and hands of the milker, in the filth of the farm yard and its pump of impure water, and in the sneeze and cough of the modern prosaic substitute for the old-time milk-maid of romance. When all these vulnerable points are attended to, milk will begin to be safe—if we guard it after we get it. But the callous public will say, "We drink milk and we don't die." Don't you, callous public? How about your children's mysteriously acquired zymotic diseases and your own unaccountable diarrheas, indigestions, and the attacks of appendicitis which you dread so much? Perhaps, though, it is just as well, for if the public knew about milk what the profession knows when it stops drinking it, to think a minute, one could never get the public to swallow a drop; for the belief of the public, when it does believe, is wilder and more unreasoning than its unbelief.

EDWARD WILLARD WATSON.

The Pennsylvania Medical Journal.

THE *Pittsburg Medical Review*, after eleven years of good work in American journalism, has been converted into the *Pennsylvania Medical Journal*, the official organ of the Medical Society of the State of Pennsylvania. The initial number of this magazine, issued last month, presents a creditable appearance, and the INTERNATIONAL MEDICAL MAGAZINE extends its best wishes for the future usefulness of the new periodical. This making a well-established journal the official organ of the Pennsylvania State Medical Society is a much better solution of the problem than the original plan of starting a new periodical.

CATTELL.

NOTE TO CONTRIBUTORS.

AUTHORS will receive liberal compensation for all accepted articles after publication; or 250 reprints, if asked for on the manuscript, will be furnished in lieu of the honorarium. It is distinctly understood that all articles appearing as original matter are for our exclusive use, and are not to be reprinted or to appear in any other publication excepting the Transactions of the Society before which the paper may have been read. Illustrated papers are especially desired.

All matters of business, as well as subscriptions, should be sent to the INTERNATIONAL MEDICAL MAGAZINE COMPANY, 3709 Spruce Street, Philadelphia.

Manuscripts, exchanges, and books for review should be addressed to the Editorial Office, 3709 Spruce Street, Philadelphia.

INTERNATIONAL
MEDICAL MAGAZINE.

Vol. VI.] AUGUST, 1897. [No. 7.

ORIGINAL COMMUNICATIONS.

METEOROLOGICAL CONDITIONS OF SUNSTROKE.[1]

BY W. F. R. PHILLIPS, M. D.,
Washington, D. C.

SUNSTROKE, insolation, heatstroke, and other more or less etiologically significant names are used to denote certain morbid phenomena which are generally understood to be produced or excited by heat, either natural or artificial. The word sunstroke is the one most frequently met with in both medical and popular literature, and for this reason will be generally adopted in this paper.

In order to avoid any misconception that might arise from the use of the term sunstroke as it is generally defined, it is necessary to state that throughout this paper it is used in a restricted sense, and has reference only to sunstroke as seen in temperate climates and to those cases that are apparently excited by abnormal meteorological conditions. Those cases that are due to artificial heat, such as the heated atmosphere of boiler-rooms and the like, although pathologically identical with those produced by general atmospheric conditions, cannot properly be considered as coming within the purview of this paper; but it is not practicable to assure ourselves that all such cases are excluded from those dependent upon the general condition of the weather. It seems also necessary to acknowledge that the line of demarcation cannot be sharply drawn between sunstrokes of purely meteorological causation and those of partly or purely artificial origin. Undoubtedly many cases of sunstroke have their inception in local surroundings, but become manifest as such after removal from the primary excitant: *e. g.*, a man working in a hot furnace-room may, after leaving it apparently well, be overcome under atmospheric conditions but slightly abnormal. Cases of this and of other sorts, which will doubtless

[1] Paper read before the 1897 meeting of the American Climatological Association.

immediately suggest themselves to you, render the study of the meteorological aspect of sunstroke very difficult and perplexing.

It seems that, in order to reach any trustworthy opinion as to the meteorological conditions influencing or producing sunstroke, it is necessary to assume some arbitrary basis or standard as to what shall constitute the presumption that the weather was the principal etiologic factor in originating the case in question.

In arriving at the conclusions to which it is the purpose of this paper to invite your attention, the author decided, as the necessary presumptive evidence of meteorological influence, that (*a*) the weather must be noticeably abnormal in some particular, (*b*) the number of sunstrokes must be sufficiently great to attract public attention, (*c*) the sunstrokes must not be confined to any particular class, trade, or occupation, or to the occupants of any one shop, office, or other structure, and (*d*) they must not be confined to a particular spot, but must occur throughout the locality subjected to the abnormal weather. Although it may not be strictly correct to use the term epidemic in connection with sunstroke, yet when the conditions just enumerated are complied with the writer will, in order to facilitate reference, speak of such compliance as constituting an epidemic of sunstroke. If this explanation regarding the use of the term be kept in mind, no confusion or misunderstanding will occur.

It will, perhaps, not be out of place to close this introduction by a brief statement of the generally accepted doctrine concerning the meteorological causation of sunstroke. The following appear to be the chief points of agreement among modern writers:

The sole efficient cause of sunstroke is heat, either as the result of direct exposure to the sun's rays or to a high atmospheric temperature in the shade.

The action of heat is much influenced by the hygrometric condition of the atmosphere. A dry, hot air, it is claimed, is better tolerated than a moist one at a lower temperature, because it favors perspiration and thereby keeps the body cool, while damp air diminishes evaporation and the refrigerating processes of the body.

Impure air is an important factor, as are also personal hygienic conditions and surroundings.

The particular degree of atmospheric temperature that may be considered one of great danger is difficult to fix because of the great tolerance of heat by persons in perfect health.

The injurious effects of heat are primarily exerted upon the nervous system.

In opposition to the importance of high relative humidity has been placed the rare occurrence of sunstroke at sea, the cases recorded having been stated to have occurred generally at night and between decks where the ventilation was extremely bad.

The special purpose of this paper is to call attention to certain facts discovered in the course of an investigation of the sunstroke epidemic of August, 1896, and to certain conclusions that seemed warranted by the facts disclosed. This investigation was made by the direction of the chief of the Weather Bureau, and the facts ascertained thereby were published in a paper contributed to the *Monthly Weather Review* for November, 1896, of which the following is a synopsis:

During the first part of August, 1896, there prevailed over a large part of the United States an exceptionally severe and prolonged period of hot weather, and during the same period there occurred a great many cases of sunstroke. This hot weather and the coincident sunstrokes were particularly severe in the Middle Atlantic and Central States. In response to a circular sent out by the Weather Bureau, information was obtained of 2,038 deaths from sunstroke; 1,817 of these were reported by the health officials of the localities in which they occurred, and the remainder were obtained from what seemed fairly trustworthy sources. The cities of Boston, New York, Brooklyn, Philadelphia, Baltimore, and Washington furnished a total of 1,461, and St. Louis and Chicago a total of 310 deaths. In addition to the number of deaths from sunstroke, there were obtained from a number of hospitals and physicians more or less complete histories of 841 cases of sunstroke.

A comparison of these meteorological and sunstroke statistics showed that: (*a*) The number of sunstrokes was greatest from August 9 to August 12. (*b*) The daily mean temperatures were highest during the same period, and were from 10° to 13° above the normal for the month of August. (*c*) The absolute humidity was at its maximum during these four days. (*d*) The relative humidity was above the normal in the Central States and below its normal in the Middle Atlantic States. The other recorded meteorologic conditions—*i. e.*, pressure, wind, rain, and state of weather—did not show any features that could be regarded as significant.

These facts seemed to warrant the following conclusions: (*a*) That the number of sunstrokes follows more closely the excess of the temperature above the normal than it does that of any other meteorologic condition. (See Tables A and C and diagram.) (*b*) That the number of sunstrokes does not appear to sustain any specific relation to the relative humidity, the maximum fatalities having occurred in one region with a relative humidity above the average, and in the other region with a relative humidity decidedly below the average. (See Tables A and D and diagram.) (*c*) That, although the absolute humidity was greatest during the maximum of sunstrokes, yet it does not appear that its variations influenced the number of cases. (See Table E.)

The only conclusion enunciated that conflicts strongly with accepted ideas is that regarding the influence of relative humidity of the atmosphere.

Inasmuch as the course of the temperature was the meteorologic con-

dition that appeared most intimately associated with the increase and decrease in the number of sunstrokes, the attempt was made to determine what degree of atmospheric temperature was necessary or likely to give origin to sunstroke. It was noticed that sunstrokes were reported in Boston when the average temperature of the day reached 82°, or 13° above the August normal. On the other hand, it was observed that the normal August temperature for New Orleans was 82°, and that too without any sunstrokes. Therefore it was evident that sunstrokes were not excited by the same degree of temperature in every locality; and, for reasons not necessary to enumerate, it was assumed that each particular locality had for its native or acclimated inhabitants a special local sunstroke temperature or range of temperature. The next step, therefore, is to ascertain, if possible, whether this particular local temperature, or climatic sunstroke temperature, as it may be called, was capable of expression as a climatological function. With this object in view, a careful examination of the temperatures prevalent during the sunstroke period appeared to show that there was empirical evidence for adopting as a provisional index to the sunstroke temperature of each climate its normal daily maximum temperature. Applying this provisional standard to the cases of sunstroke as reported in the cities of New York, Boston, Philadelphia, and Washington, the following results were obtained.

In New York City 96% of the cases occurred with daily mean temperatures equal or nearly equal to the normal maximum temperature for August, the period in question. In Boston and Philadelphia 91% and in Washington 77% of the cases occurred under like conditions of temperature. In the light of these results, the following working hypothesis was proposed:

Sunstroke becomes imminent during the summer months when the mean temperature of any one day or of several consecutive days becomes equal or nearly equal to the normal maximum temperature for the period.

In order that the Association may judge as to the validity of the foregoing conclusions and hypotheses, the statistics upon which they were based are submitted in the appended tables.

Inasmuch as the foregoing facts and conclusions seem resolvable into the generally-accepted proposition that heat is the sole efficient cause of sunstroke, the chief point of interest centres in determining what degree of atmospheric temperature is likely to produce in a given community an epidemic of sunstroke. I think we may safely assume that while humidity, relative and absolute, wind, and pressure may, under special conditions, be very important to a particular individual, they are, as causative factors of sunstroke as a widespread event or epidemic, obscured and sink into insignificance by comparison with the overwhelming effect of high atmospheric temperature or intense direct insolation.

Taking this view of the subject, I have endeavored to find, by using

such statistics for other years as were accessible, how far the hypothesis stated could be depended upon as a criterion of impending danger from sunstroke, with the result that it appears to be a fairly good index for the eastern and central parts of the United States. But it is to be remembered that, although it embodies certain plausible climatological considerations, it was evolved simply as an empiricism based upon quite a large number of events, and that it does not rest upon a satisfactory knowledge of all the factors involved.

As a matter of possible interest, it may be stated that the fatality among the 841 cases previously referred to as reported by hospitals and physicians was 16.6%. It may also be interesting to state what appeared to be the influence of alcoholic beverages in determining both the incident and fatality of the affection. Of the 841 cases the history of 465 as to the use of alcoholic drinks is given as follows:

Using to excess	140	cases, or	30 per cent.
Using moderately	230	" "	50 " "
Using not at all	95	" "	20 " "
Total	465	" "	100 " "
History unknown	376		
Total	841		

and of the 140 deaths that occurred the history of 70 is given as follows:

Using to excess	41	deaths, or	60 per cent.
Using moderately	22	" "	30 " "
Using not at all	7	" "	10 " "
Total	70	" "	100 " "
History unknown	70		
Total	140		

TABLE A.—*The daily number of cases of sunstroke admitted to certain hospitals or in the practice of certain physicians from August 1 to 20, inclusive, 1896, together with the resulting mortality.*

Places.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total cases.	No. of deaths.	Authority (hospital or physician).
Manchester, N. H.	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	1	Elliot Hospital.
Albany, N. Y.	....	....	....	....	....	....	....	1	...	4	5	5	....	....	....	....	....	....	....	....	15	3	Albany Hospital.
Rochester, N. Y.	....	....	...	....	....	....	....	2	....	....	....	....	....	1	2	....	....	....	....	....	5	.....	Homeopathic Hospital.
Boston, Mass.	....	....	....	....	....	....	....	....	....	4	8	18	2	....	....	1	....	....	....	....	33	8	Boston City Hospital.
New Haven, Conn.	....	....	....	....	....	....	....	....	....	2	2	4	7	3	2	....	....	....	....	....	20	2	New Haven Hospital.
New York, N. Y.	....	....	...	2	3	9	5	12	15	49	78	106	64	9	5	....	....	....	....	....	357	62	Hudson Street, Roosevelt and New York hospitals.
Brooklyn, N. Y.	....	....	....	..	....	2	4	8	5	11	26	32	11	2	2	....	....	....	....	....	103	22	St. John's, St. Mary's and Brooklyn hospitals.
New Brunswick, N. J.	....	....	....	....	....	1	....	....	1	....	3	....	....	....	....	....	....	....	....	....	5	2	Drs. Williamson and Smith.
Philadelphia, Pa.	....	....	....	....	1	9	11	13	8	22	30	34	21	13	2	....	....	....	....	....	164	16	St. Agnes, Episcopal, Medico-Chirurgical and Hahnemann hospitals.
Washington, D. C.	....	....	....	....	1	1	2	3	2	5	1	3	2	....	1	1	....	....	....	....	22	7	United States Government Hospital for Insane, Garfield, Providence and Freedman hospitals.
Middle Atlantic States	....	....	....	2	5	22	22	39	31	97	154	202	107	28	14	2	....	....	....	....	.....	.....	
Pittsburg, Pa.	...	....	...	....	....	....	....	1	....	....	....	1	....	....	....	..	....	....	....	....	2	2	S. S. Hospitals.
Cincinnati, Ohio	....	....	3	2	2	4	2	8	4	9	7	....	1	2	3	....	....	....	1	....	48	5	United States Marine Hospital, St. Mary's and Cincinnati hospitals.
Columbus, Ohio	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	2	.....	St. Francis' Hospital.
Cleveland, Ohio	....	....	....	....	....	....	....	....	4	4	1	....	....	....	....	....	....	....	....	....	9	2	St. Alexis', St. John's and Huron Street hospitals.
Detroit, Mich.	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	2	.....	United States Marine Hospital.
Holland, Mich.	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	2	.....	Dr. Henry Kremeis.
Chicago, Ill.	....	....	....	2	1	1	1	6	3	1	1	....	....	2	1	....	....	....	....	....	19	4	St. Luke's, Mercy and Michael Reese hospitals.
Springfield, Ill.	....	....	....	....	1	....	....	....	....	....	1	....	....	....	..	....	....	....	....	....	2	.....	City physician, Wabash Emp. Hospital.
Louisville, Ky.	....	....	2	1	...	3	1	....	2	....	....	..	....	....	....	..	....	....	....	....	9	.....	City Hospital.
Cairo, Ill.	....	....	....	....	..	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	.....	Dr. W. F. Grinsted.
Hannibal, Mo.	..	....	....	1	....	....	3	....	....	....	....	1	....	....	....	....	....	....	....	....	5	1	Drs. R. H. Godin, S. Q. Smith, P. L. Kabler.
Columbia, Mo.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	.....	Dr. W. A. Norris.
Kansas City, Mo.	....	....	....	....	....	1	....	....	2	....	....	....	....	1	....	....	....	....	....	....	4	1	Drs. W. S. Wheeler, L. A. Berger, C. L. Hall.
Des Moines, Iowa	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	.....	Dr. F. L. Wells.
St. Paul, Minn.	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	2	1	City and County Hospital.
Central States	....	....	6	7	4	9	8	16	17	15	11	2	1	6	5	...	....	....	1	1	.....	.....	
Raleigh, N. C.	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	.....	Rex Hospital.
Charleston, S. C.	....	....	....	..	...	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	.....	City Hospital.
Mobile, Ala.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	.....	Dr. J. A. Abrahams.
Dallas, Tex.	....	....	....	1	...	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	3	.....	Parkland Hospital.
Palestine, Tex.	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	Dr. J. M. Colley.
Grand total.	1	....	6	10	9	31	30	56	48	112	166	204	108	34	19	2	....	1	1	3	841	140	

TABLE B.—*The daily number of deaths from sunstroke occurring in certain regions between August 1 and 20, inclusive, 1896.*

August, 1896.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Authority.
Massachusetts, Connecticut, Rhode Island, New York, Pennsylvania, Maryland, District of Columbia, and Virginia	....	...	....	....	4	11	11	28	107	204	274	264	108	37	5	4	....	2	1	1	Newspaper clippings, health officers' reports, special reports, physicians, and others. (The information from which this table is compiled is far from complete.)
Ohio, Kentucky, Tennessee, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, and Oklahoma	....	1	....	5	5	14	16	13	50	100	58	14	3	1	....	2	1	....	....	1	
Total	....	1	....	5	9	25	27	41	157	304	332	278	111	38	5	6	1	2	1	2	

TABLE C.—*The mean temperature of each day at certain selected stations during the sunstroke epidemic of August 3 to 18, inclusive, 1896.*

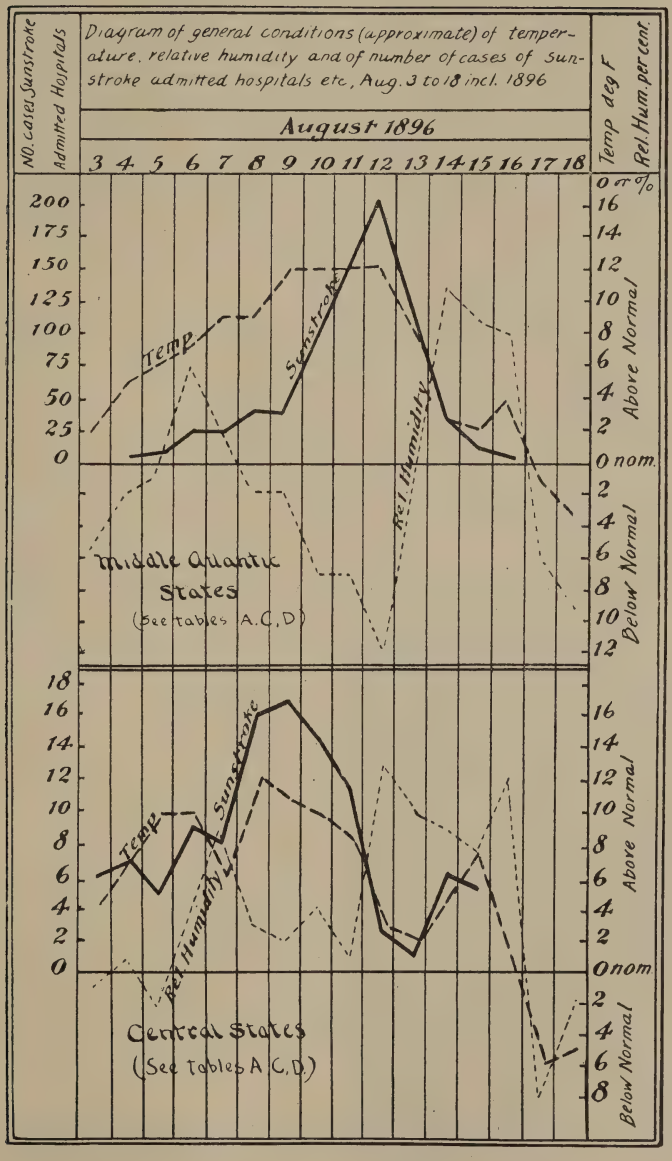
PLACE.	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Normal.	Normal Maximum.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
Albany, N. Y	72	78	82	83	82	82	82	84	83	82	77	76	75	74	69	64	71	80
Boston, Mass	71	78	72	65	77	75	82	86	82	82	76	71	67	74	72	68	70	78
New Haven, Conn	71	77	80	72	77	81	82	84	83	84	82	74	72	73	69	64	70	78
New York, N. Y	74	77	80	82	80	82	82	84	85	84	81	75	74	73	68	65	73	80
Philadelphia, Pa	77	79	82	86	84	86	87	84	87	87	85	77	79	78	74	71	74	82
Washington, D. C	78	80	83	88	87	84	87	84	84	86	82	78	77	79	73	71	75	84
Chicago, Ill	77	82	84	79	77	87	83	86	81	73	72	78	76	72	68	65	71	78
St. Louis, Mo	82	86	88	90	91	91	90	84	86	82	79	81	86	77	72	72	77	86
Cincinnati, Ohio	78	78	81	85	76	84	85	84	82	78	80	78	82	76	68	70	75	84
Charleston, S. C	84	80	83	82	82	85	87	86	84	82	84	82	80	84	86	80	81	87
Jacksonville, Fla	86	84	82	83	84	84	86	86	86	84	85	83	84	84	84	86	82	90
New Orleans, La	82	86	86	84	84	81	78	82	82	86	84	82	80	82	85	87	82	88

TABLE D.—*The departure of the daily relative humidity from the normal at certain stations from August 3 to 18, inclusive, 1896.*

	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Normal
	%																%
Albany	0	+ 3	− 7	− 5	+ 9	+8	+4	− 4	− 3	− 5	+ 1	− 2	− 6	+ 8	−20	+ 5	76
Boston	− 2	− 9	+ 3	+19	+ 9	−3	−1	− 5	−12	− 5	+ 1	+16	+14	+ 7	−15	−11	75
New Haven	− 1	− 1	− 8	+15	+13	−3	−1	− 1	− 7	− 7	− 5	+15	+ 9	+ 1	− 9	−11	79
New York	0	+ 2	− 9	+12	+ 7	+4	+4	−10	− 4	−10	− 7	+17	+15	+12	+ 2	+10	74
Philadelphia	− 9	0	− 2	+ 2	+ 1	−3	−2	−12	−14	−20	− 6	+ 6	+ 8	+10	−30	−16	72
Washington	− 9	0	+ 4	− 8	− 7	−8	−7	− 8	− 6	−13	+12	+ 4	0	+ 2	−12	−18	76
Chicago	− 3	− 3	− 6	+12	+14	+1	+5	+ 7	− 1	+18	+16	+12	+ 6	+ 8	−14	− 8	68
St. Louis	+ 1	+ 4	− 1	− 9	− 3	−1	−7	+ 3	+ 3	+18	+ 9	+ 9	+11	+22	+19	+23	67
Cincinnati	− 1	+ 3	+ 1	+ 7	+15	+9	+7	+ 3	0	+ 4	+ 6	+ 5	+ 5	+ 7	−10	−10	65
Charleston	+ 4	+ 6	+ 2	0	− 1	+1	−5	− 3	− 1	+ 2	− 1	+ 1	0	− 1	+ 1	+ 4	82
Jacksonville	−13	+ 7	+ 3	− 1	− 3	−6	−8	−11	− 4	− 8	+ 3	− 5	− 1	− 3	− 7	− 3	81
New Orleans	− 2	+ 5	−11	− 5	− 1	0	+1	+ 3	− 9	−13	− 3	0	+ 3	0	− 7	− 6	79

TABLE E.—*The daily absolute humidity (grains per cu. ft.) at certain stations from August 3 to 18, inclusive, 1896.*

	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Normal.
Boston	6.6	7.0	6.6	6.1	8.5	7.5	8.8	8.0	8.0	8.5	7.0	7.0	6.4	6.6	5.0	4 4	5.6
New York	6.6	7.5	7.7	8.5	8.5	8.5	9.4	8.0	8.8	8.0	7.5	8.0	7.5	8.0	5.6	5.2	6.1
Philadelphia	6.2	7.5	8.0	9.1	8.5	8.5	9.1	8.2	8.0	7.2	8.0	8.0	7.5	8.0	3.8	4.2	6.1
Washington	7.0	8.0	9.1	8.5	8.2	8.5	10.0	7.5	8.5	8.5	8.0	8.0	8.0	8.5	5.6	4.7	6.6
Chicago	6.4	7.2	7.5	8.0	8.5	8.5	9.4	8.8	8.0	7.5	7.2	7.5	6.8	6.1	4.9	4.1	5.4
St. Louis	7.5	8.8	9.1	8.5	9.1	9.4	8.5	8.5	9.1	8.5	8.0	8.2	8.5	8.5	7.5	7.5	6.1
Cincinnati	6.6	7.2	7.5	8.0	8.0	8.5	8.8	8.5	7.5	7.0	7.7	7.5	7.5	7.0	4.1	4.4	5.7
Charleston	8.8	9.6	9.6	9.1	9.4	9.6	9.1	9.6	9.6	9.6	9.1	9.6	9.1	9.4	9.4	9.1	8.8
Jacksonville	8.5	9.1	9.1	9.1	8.8	8.5	8.5	8.2	8.5	8.5	9.4	8.8	9.1	8.8	8.5	9.1	8.5
New Orleans	9.1	8.8	8.5	8.5	9.1	8.0	8.5	8.8	8.0	7.5	9.1	8.5	9,1	8.8	9.1	9.1	8.5


No. cases Sunstroke Admitted Hospitals
Diagram of general conditions (approximate) of temperature, relative humidity and of number of cases of sunstroke admitted hospitals etc, Aug. 3 to 18 incl. 1896
August 1896
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
Temp deg F
Rel. Hum. per cent.
Above Normal
Below Normal
Temp.
Sunstroke
Rel. Humidity
Middle Atlantic States
(See tables A, C, D)
Central States
(See tables A, C, D)

TUBERCLE OF THE IRIS.[1]

BEING A REPORT OF A CASE OF TUBERCLE OF THE IRIS, WITH REMARKS ADDRESSED TO THE INQUIRY, DOES TUBERCLE EVER OCCUR PRIMARILY IN THE IRIS?

BY JOSEPH A. ANDREWS, M.D.,

Ophthalmic Surgeon to the City (Charity) Hospital, New York City.

TUBERCLE of the iris is a comparatively rare disease. It has been mistaken for syphilitic gumma, and even for malignant disease. It is claimed by some observers that it does occur primarily in the iris. With a view to ascertaining the facts bearing upon the differential diagnosis and the question relating to the primary seat of the disease, I have prepared a brief synopsis of all the cases of tubercle of the iris which have been recorded in medical literature up to the present time.

CASES OF TUBERCLE OF THE IRIS IN WHICH THE EYE WAS ENUCLEATED, INCLUDING THE SUCCESSFUL AND UNSUCCESSFUL CASES.

CASE I.—Andrews, J. A. The patient, a girl, aged seventeen years, was seen by me on February 24, 1894, in consultation with Dr. C. W. Townsend. The lower half of the iris of the right eye was occupied by a nodular growth of a light yellowish-gray color, with a few faint red blotches on its surface resembling hemorrhages; no vessels or growth; faint circumcorneal injection; sclerotic white; cornea clear; upper half of iris was apparently unchanged; tension normal; no pain; no signs of intracranial disturbance; nor was there evidence of tuberculous or syphilitic disease elsewhere in the body; family history negative as to syphilis and tuberculosis. The patient had been under treatment for gumma for two or more months before consulting Dr. Townsend; the effect of mercurial treatment had been negative. It was believed that syphilis could be excluded; moreover, the clinical picture of gumma of iris was absent. The case, it appeared to me, resolved itself into a question of diagnosis between sarcoma of the iris and tubercle. In color sarcoma of the iris varies. It may have a *flesh-tint*, or be *reddish* gray, blackish, or light brown; the color depending on the amount or absence of pigment and the degree of vascularity. From what I had seen of tubercle of iris in rabbits after inoculation, I was disposed to regard

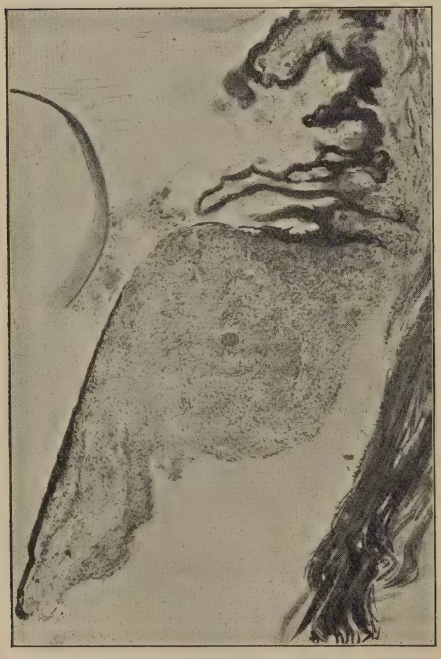


FIG 1.—Photomicrograph of iris, showing giant cell. (Reduced one-half from original.)

[1] Paper read before the meeting of American Ophthalmological Society, 1896.

the case as one of tubercle. The nodular appearance, the color of the growth, the course of the disease, and the absence of active inflammation pointed to tubercle, and this was my diagnosis. I advised enucleation. The parents of the girl would not consent to the operation. Dr. Mittendorf, who was next asked to see the patient, expressed the opinion that the trouble was in all probability the result of a simple inflammatory exudation, and advised tentative treatment. Dr. Townsend informed me that, four or five weeks after I had seen the patient with him, she showed signs of intracranial disease, whereupon the eye was enucleated.

I am indebted to Dr. Mittendorf for the eye, which I obtained from him for microscopic examination. A microphotograph (for which I am indebted to Dr. Edward Leaming, of the College of Physicians and Surgeons, New York), was made for me with a one-fourth-inch Bausch and Lomb objective, magnifying 190 diameters, from one of my sections of the growth (Fig. 1). The clinical features of the growth are shown in the picture of the eye (Fig. 2). In the absence of any indication of a syphilitic taint, the microphotograph may be regarded as furnishing a picture of the histological characteristics of tubercle. In the cell infiltration are seen nodules consisting of closely-crowded lymphoid and epithelioid cells. In the middle of the nodules is seen a polynucleated giant cell. Immediately surrounding the giant cells is necrotic tissue. The connective-tissue envelope usually found in gumma is absent in all the sections. Other sections of the growth show cell infiltration of the ciliary body. All other parts of the eye—*i. e.*, sclerotic, cornea, choroid, retina, and optic nerve—were apparently normal. No inoculation experiments were made by Dr. M. The eye had lain so long in Müller's fluid that I did not expect to be able to demonstrate the presence of *Bacillus tuberculosis*. I removed as much of Müller's fluid as I could by soaking the eye in distilled water, after which it was transferred to alcohol. A great many sections were made and stained with Ziehl's fluid, some of the sections remaining in the staining fluid for twenty-four hours. Tubercle bacilli could not be found.

FIG. 2.—Macroscopic appearance of the eye affected with tuberculosis of the iris. (Natural size.)

CASE II.—Gradenigo (Venice, 1868) (see *Annal d'oculistique*, 1870, p. 175). Man, aged twenty-one years. On right side, conjunctival edema, with intense pericorneal injection and *round gray spots* of pin-head size in cornea (Descemet's membrane?). Iris showed slight diffuse discoloration, with six or seven submiliary nodules; contracted pupil and posterior synechiæ. Hemorrhages occurred several times in the eye. After some time several nodules could be seen in fellow eye, but unaccompanied by inflammatory symptoms. Eye was not enucleated. After three months patient died. *Autopsy* revealed general miliary tuberculosis, with both old and recent tubercles. This is the first recorded case of tubercle of the iris.

CASE III.—Weiss (*Arch. f. Ophth.*, 1877, p. 57). Man, aged fifty-one years. Patient had recently recovered from pneumonia when eye trouble began. Well characterized tubercles were found in all parts of the eye. Patient was apparently healthy. The eye was enucleated. Five months after enucleation there developed upon the upper jaw, on the side corresponding to that of the diseased eye, a tumor, which, after removal, proved to be an enlarged lymph gland containing cheesy matter and tubercles.

Case IV.—Guilio Saltini (*Annal. d'Ottal.*, Vol. IV., p. 127, 1875). Girl, aged sixteen years. Attempted excision, but had to enucleate. Patient did well.

Case V.—Samelsohn (*Niederrheinische Gesellschaft f. Natur und Heilkunde* in Bonn, December, 1878). Girl, aged seventeen years. The tumor was nodular and of a *yellowish-white* color; it extended to middle of pupil in horizontal meridian, and had no vessels; the growth perforated the eyeball. Samelsohn reported again on the case in 1880. Before enucleation small particles of tumor were removed from the anterior chamber and put into the eye of a rabbit. They were completely absorbed; tubercle of iris did not ensue. Immediately before enucleation the eye was opened and part of the granulation was placed in the eye of a rabbit. This experiment resulted in nothing; but upon a second and third trial the inoculation was followed by positive results, *i. e.*, tubercle of the iris. In one of the rabbits tubercles spread throughout the organs of the body, with the exception of the lungs. The microscopic examination of the cheesy mass in the anterior chamber had been fruitless, but inoculation experiments confirmed the diagnosis. This is the first case on record in which the diagnosis of tuberculous eye disease was confirmed by inoculation experiments. There were other signs of tuberculous disease in the patient. The case was, therefore, not one of primary tubercle of the iris.

Case VI.—Parinaud (Société de Chirurgie, July 9, 1879). Boy, aged twelve years. *Whitish* infiltration in iris. Pus in anterior chamber. Trouble began as progressive dimness of sight, without pain.

Case VII.—Alexandre (*Recueil d'ophth.*, 1884). Antecedent family history negative. Enucleation. Inoculation of eye of dog; 20 days later tubercle of iris appeared, containing *tubercle bacilli.*

Case VIII.—Perls (*Arch. f. Ophth.*, Vol. XIX., p. 221, 1873). Boy, aged six months. Mother said to be healthy; father had contracted syphilis a year before the boy was born. Father had infiltration in apex of right lung, followed by formation of a cavity. Boy showed no signs of congenital syphilis; was strong and well nourished. When first seen by Perls, boy was suffering from acute *kerato-iritis.* In iris of left eye was a slightly elevated, circumscribed nodule, which Perls regarded as a gummy tumor. Professor Julius Jacobson concurred in this diagnosis. In spite of the use of mercurials, eye trouble grew worse, but the general condition of the boy remained good. Gradually, the apex of the child's right lung became infiltrated, and he became reduced by cough, loss of appetite, and slight fever. Convulsion occurred three days before death, which took place about one month after he was first seen by Perls. *Autopsy* showed *disseminated miliary tuberculosis.* The trouble appears to have begun as a cyclitis, progressing to suppurative corneal ulcer and infiltration of entire iris.

Case IX.—Arthur Costa, Pruneda (*Arch. f. Ophth.*, XXVI., 3, p. 174, 1881), records two cases of tubercle of iris. Girl, aged thirty-eight weeks. Not known how long her eye had been affected. Born with sound eyes. No general disease. Mother had night-sweats and cough, with increasing weakness. L. E., purulent irido-cyclitis, with ectasia of ciliary region; slight irritation. *Enucleation.* Successful inoculation experiments.

Case X.—Boy, aged four months. Iritis, with numerous *grayish nodules.* Syphilis excluded. *Enucleation.* Child died seven months after enucleation. Death believed to have been caused by tuberculous meningitis. No inoculation experiments. No autopsy.

Case XI.—Deutschmann (*Arch. f. Ophth.*, XXVII., 1, p. 317, 1881). Tu-

bercle of iris and ciliary body. Boy, aged five years. Iritis, with complete closure of pupil; high degree of inflammatory degeneration, duration of disease, about fourteen days. No trauma; eye was hard; whole extent of iris and pupil of *gold-yellow* color; cornea slightly hazy. Professor Leber, under whose care patient was, attempted to excise the growth, but the operation was followed by more inflammation. *Enucleation.* Healing was good. Child was doing well six years after enucleation. The eye was sent to Deutschmann for microscopic examination. No inoculation experiments. Deutschmann calls the case a *genuine iris tuberculosis.* Full account of histological examination.

Case XII.—Wolfe, J. R. (*Brit. Med. Jour.*, 1882, Vol. II., p. 299). Boy, aged eight years. Tubercle followed injury to eye. The tumor was divided into nodules of a *yellowish-white* tinge; fine vessels on surface of growth. Attempted to excise, but had to enucleate eye.

Case XIII.—Rütter, H. (*Arch. f. Ophth.*, 1882, p. 406). Case from Hirschberg's Clinic. Boy, aged two years. R. E. normal; L. E. showed a high degree of pericorneal injection. Lateral half of anterior chamber filled with a *cheesy mass;* cornea transparent. *Gray miliary nodules in medial half of iris.* Pupil closed by thin exudation; above in sclera was a prominent *yellowish-white nodule.* Attempted to remove cheesy mass from anterior chamber; four weeks later, enucleated eye. Child had twice been at the point of death. At time of second attack of illness (cramps), the mother noticed a gray spot "in the pupil" of left eye. Child had marked hydrocephalus.

Case XIV.—Swanzy, H. R. (*Transactions of Ophth. Soc. of United Kingdom*, 1882, p. 259). Girl, aged two years. Apparently in good health; no syphilis on side of parents. Father suffered from chronic tuberculous disease of right ankle-joint. Mother also phthisical. One child died of tubercular meningitis. *Yellowish-white* tumor, free from vascularization, situated in upper outer quadrant of iris. It was 4 mm. long and $2\frac{1}{2}$ mm. wide. In lower quadrant of iris, near pupillary margin, were two minute tumors, size of pin's head. No posterior synechiæ and but little pericorneal injection. Child seemed free from pain. *Enucleation.* Eye showed histological appearances of tubercle. This case was observed before discovery of *Bacillus tuberculosis.* No inoculation experiment undertaken. Swanzy remarked that he regarded the case as one of *primary tubercle of iris.* Four months after enucleation child was very well.

Case XV.—Schell, H. S. (*Transactions of American Ophth. Soc.*, 1883, p. 472; colored plate; not typical). Boy, aged nine years. Projecting from nasal side of pupillary margin was a small *yellowish-white nodule*, tinged with *pink*, the size of a pin's head; circumcorneal injection; pupil immovable. Eight months after first seen anterior chamber was nearly filled with new growth, which had a yellowish tinge, with a few minute blood-vessels on its surface. *Intra-ocular tension* was increased. Eye was tender on pressure, but not otherwise painful. Nine months after onset of eye trouble the eye was enucleated. The microscopic examination is incomplete. It appears that the trouble began as an ordinary plastic iritis, which did not yield to mercury and atropin. Two months later the child had well-marked signs of coxalgia in second stage. It appears that the child never had been well. Mother had pulmonary phthisis. Twenty-four ounces of pus released from abscess on outer side of child's thigh. After enucleation child did well. Discharge from thigh ceased, and patient left hospital three months later with good movement of hip and but slight shortening of limb. Dr. Schell remarked that he had removed the eye with the hope of preventing extension of the disease.

Case XVI.—Wadsworth, O. F. (*Transactions of American Ophth. Soc.*, 1883,

p. 474). Girl, aged three and one-half years. Child's mother had noticed redness of left eye before consulting Drs. Wadsworth and H. Derby. Mother said that, except when eye was looked at or drops put in, there had been no complaint of pain. Examination showed cornea hazy; bulbar conjunctiva moderately congested; no marked ciliary congestion; pupil moderately dilated; upper portion of iris apparently thickly set with vessels; yellowish reflex from pupil; no record of tension. Diagnosis wavered between glioma and irido-choroiditis. Two weeks later eye was enucleated. At time of enucleation there was considerable circumcorneal injection. Above was a staphyloma in ciliary region. No trace of iris visible. The growth reached forward nearly to cornea; color of growth *yellowish white;* numerous blood-vessels and some hemorrhages on surface of growth. Child continued in comparatively good health for five months; then for five or six weeks she complained of headache, and died from tuberculous meningitis. No autopsy. *Bacillus tuberculosis* was found in growth. Although previous to enucleation family history pointing to phthisis was denied, it was learned after death of child that child's father and a brother of father had died from phthisis, and that the patient herself had been subject to bronchial attacks.

Case XVII.—Eperon (*Arch. d'Ophtal.*, 1883, p. 487). From Landolt's Clinic. Girl, aged five years. Irido-cyclitis, and minus tension when first seen; twenty days later, hypopyon almost filling anterior chamber; perforation of cornea. *Enucleation.* No inoculation experiment; family history negative.

Case XVIII.—Eperon (*Ibid.*, p. 494). Girl, aged seventeen years. Calls this a case of chronic form of tubercle of iris. It was characterized by slow development. One of the girl's sisters died of phthisis. Both eyes inflamed with small grayish infiltration in iris. *Iridectomy.* Recovery good; but subsequent history is wanting.

Case XIX.—Standish, Myles (*Transactions of American Ophth. Soc.*, 1885, p. 59). Girl, aged fourteen years. Family history negative as to phthisis or syphilis. One year previous to appearance of eye trouble, girl had acute hepatitis. Four weeks before being seen by Dr. S., patient had complained of general feeling of malaise. About the same time her right eye began to trouble her. No history of trauma. Eye became red and sight gradually became dim; not much complaint of pain. Examination showed conjunctiva bulbi somewhat hyperemic in certain areas near sclero-corneal margin; cornea somewhat hazy, with several deposits on membrane of Descemet; iris firmly attached to capsule of lens throughout its entire pupillary margin; pupil blocked by lymph. Above pupil, springing from iris near its ciliary border, was a *round protuberant growth*, 2 mm. in diameter, of a yellowish color, slightly tinged with pink; several small vessels seen to course over surface of tumor; vision $= \frac{6}{200}$. The case was watched for four weeks, during which time tumor slowly increased to double its size when first seen; no pain, conjunctiva white, *i. e.*, no injection of vessels of conjunctiva; vision then was perception of light only. *Enucleation.* Patient made good recovery. *Bacillus tuberculosis* found in specimen of tumor.

Case XX.—Knapp, Herman (*Beitrag zur Tuberkulosenfrage. Festschrift v. Helmholtz*, 1891, p. 30; sixteen colored drawings). Man, aged twenty-five years. Had been treated for month by another surgeon for syphilitic iritis. Slight circum-corneal injection; cornea, clear; dirty-brown, swollen iris, with uneven surface and irregular pupil; tension, normal; vision $\frac{10}{30}$; visual field complete. A number of *grayish-yellow nodules* irregularly imbedded in iris. Fellow eye healthy. *Enucleation. Bacillus tuberculosis* not found in specimens of growth. Inoculation of anterior chamber of two rabbits. No reaction for four weeks after inoculation; then in one of the rabbits fine nodules appeared in both irides;

in other rabbit, thirty days after inoculation, a dozen submiliary nodules appeared in numerous places in iris of right eye. Under slight ciliary injection the nodules increased in size and number.

CASE XXI.—Redmond, D. D. (*Transactions Oph. Soc. United Kingdom*, 1892, p. 84). Girl, aged ten years. Delicate child. A week before consulting Dr. Redmond, she had had severe wetting, since which time her eye had been inflamed. On examination, V. was barely equal to perception of light; pupil was secluded; iris was retracted; very deep anterior chamber. She was treated with mercury and instillations of atropin, but matters grew daily worse. In a week a *grayish deposit* began to appear on iris, which rapidly increased. In three weeks perception of light was abolished, the anterior chamber being full of grayish exudation with little reddish matter on surface resembling hemorrhage; ciliary region had become staphylomatous. Diagnosis of tubercle was made and eye enucleated. Microscopic examination. Cornea and optic nerve normal.

CASE XXII.—Higgins, Charles (*Transactions Ophth. Soc. of United Kingdom*, 1892, p. 83). Boy, aged two years. Healthy-looking child had a fall one month before first seen by Dr. Higgins, at which time something was found to be wrong with R. E. Had begun to suffer from diarrhea and pain in head. No history of phthisis in family. Mother had had four still-born children. When first seen R. E. showed *yellowish nodule* in iris near angle of anterior chamber at its outer and lower part; some swollen spots were scattered about on surface of iris; there was severe iritis; a film of lymph covered pupil; cornea was hazy; no reflex from fundus; T. + 1; eye appeared to be very painful. Child took gray powders for a fortnight, but eye grew worse. *Enucleation.* Did not demonstrate presence of *Bacillus tuberculosis.* Five weeks later child was fat and "in excellent health;" tubercle in iris; *Bacillus tuberculosis* found in iris. Child made a rapid recovery, and one and a-half years after the operation was strong and healthy.

CASE XXIII.—Knaggs, R. L. (*Transactions Ophthal. Soc. United Kingdom*, 1892, p. 79). Boy, aged nine months. R. E. had been noticed by parents, two months before consulting Dr. Knaggs, to be altered in color. Examination showed aquum of R. E. to be turbid, iris cloudy; projecting from anterior surface of iris were from fourteen to twenty white nodules size of pin's head. Except for faint ring of ciliary injection, eye was not inflamed. L. E. normal. Child subject to profuse head sweats and bronchial attacks. No external signs of syphilis, and nothing in history to suggest it. Four sisters, a paternal aunt, and a cousin of child's mother all died of phthisis. Mercury had been used without avail. Later growth became larger and of a yellowish color. *Enucleation.* No mention of *Bacillus tuberculosis;* no inoculation experiments. Child died from tuberculous meningitis seven weeks after enucleation.

CASES IN WHICH TUBERCLE OF IRIS WAS SUCCESSFULLY EXCISED.

CASE XXIV.—Treitel, Th. (*Berliner klin. Wochensch.*, 1885, p. 445). Boy, aged twelve years. Gave history of injury to left eye by falling against a bundle of straw, three months before consulting Dr. Treitel. R. E. normal. L. E., V. = fingers at twelve feet; no improvement with glasses. Upper lid slightly swollen; slight photophobia; no change in position or mobility of eye; slight pericorneal, and episcleral injection; cornea slightly hazy; on posterior wall of cornea, in lower half, were five irregularly arranged whitish-gray precipitates about the size of a pin's head; small superficial infiltration of cornea, externally near sclera; fine vessels extended to the precipitates on posterior surface of cornea; a *reddish-yellow* growth, size of small pea, at middle of temporal half of

iris ; on surface of growth was a network of fine blood-vessels ; surface of growth is uneven ; minus tension ; eye not sensitive to touch. No signs of disease anywhere else in body ; had chronic bronchial catarrh ; no inoculation experiments undertaken ; no record of finding of *Bacillus tuberculosis*. Treitel did a second operation (iridectomy), as there was a reappearance of the disease after first operation. Patient was dismissed from hospital, and there the history ends. Not convincing as to cure.

Case XXV.—Terson (*Arch. d'Ophth.*, 1890, p. 9). Girl, aged twelve years. At outer extreme periphery of anterior chamber there was a *whitish-yellow* growth of size of pin's head; pronounced injection of sclera on level with growth; small grayish spots on Descemet's membrane ; epithelium of cornea slightly elevated and wrinkled; no posterior synechiæ; no history of injury. Family history negative as to syphilis and tuberculosis. Treated with mercurials without avail. Four months after first seen, growth was excised through a corneal wound made with a Graefe knife. A small amount of vitreous escaped when growth was excised. Wound healed kindly and patient made a good recovery. Inoculated two guinea pigs. One of the animals was killed twenty days after inoculation; the other was killed thirty-eight days after inoculation. Numerous tubercles were found. Four months after excision the patient was doing well.

Pagenstecker and de Wecker are also quoted as having successfully excised tubercle of iris ; but I find no data relating to these cases.

Case XXVI.—Schueller (*Inaug. Dissert.*, Halle, 1888). Boy, aged five years. Nodular growths on iris were removed by iridectomy. A few weeks later, a new tumor appeared in iris ; this disappeared under treatment by inunction and potassium iodide. Two and one-half months later, patient was dismissed from treatment with eye perfectly free from irritation. Claims to have proved tubercular nature of growth by inoculation.

CASES OF SUPPOSED SPONTANEOUS CURE OF TUBERCLE OF IRIS.

Case XXVII.—Liebrecht (*Arch. f. Ophthal.*, XXXVI., 4, 1890, p. 227). Girl, aged ten years, came complaining that right eye had been red for one or two weeks ; no pain ; slight photophobia. Instillation of atropin revealed following picture in R. E. : Slight ciliary injection ; pupil attached below to capsule of lens. In centre of somewhat swollen iris were *whitish* nodules of different sizes ; no vascularization surrounding the nodules ; nodules were not vascular. Vision normal. Ophthalmoscopic examination showed distinct haze of disc and neighboring retina; whitish haze about macula ; cloudy vitreous; the participation of ciliary body showed itself by presence of numerous flocculent deposits on Descemet's membrane. After four weeks nodules became swollen ; the other symptoms also receded. Four months later only signs of former disease left were depressions in iris. Change in fundus had disappeared. Vision = 1. Treatment consisted of use of potassium iodide. Hereditary gummous iritis was not disproved in this case. Tuberculosis was not proved. Liebrecht thinks this case was one of attenuated tuberculosis.

Case XXVIII.—Van Duyse (*Arch. d'opth.*, 1892, p. 478). Girl, aged twelve years. When first seen she presented all the symptoms of a serous irido-cyclitis, with abundant precipitates on posterior surface of cornea ; pupil moderately dilated by atropin ; there was ciliary injection ; conjunctival vessels hyperemic ; no complaint of pain, but there was photophobia. After two months girl left dispensary. At time of leaving she counted fingers at two metres. Treatment consisted of mercurial inunction to temples, instillation of atropin and cocaine, and internal use of potassium iodide and cod-liver oil. No mention made of

intra-ocular tension. Four months later right cornea showed *grayish* interstitial opacities. At inferior irido-corneal angle were two *whitish-gray* nodules about two mm. in diameter; a third nodule was situated a little higher and midway between pupillary border and periphery of iris; a fourth nodule, three mm. in diameter, was situated at periphery; iris slightly vascular; the phenomena of irido-cyclitis had disappeared, but the affection was indolent. There was a mass of grayish miliary nodules in iris of left eye; they were more or less vascular on surface, especially at periphery. Treatment: instillation of atropin, periocular mercurial inunction, hot compressor, cod-liver oil, and iodide of iron. Child was anosmic; no enlarged gland in neck; no splenomyelia; teeth showed no signs of hereditary syphilis; hearing normal; no swelling of long bones. Examination seemed to point to *latent* tuberculosis. There were signs of old pleurisy at apex of lungs. History of syphilis in father negative; mother was very delicate and had facial lupus; one of patient's brothers died of meningitis, aged three years. *Inoculation experiments* negative. Three months after second course of treatment had begun nodule in iris had disappeared.

Case XXIX.—Denti (Ophthal. Section of International Med. Congress, Rome, 1894). Claims to have seen spontaneous healing of a case of tubercle of iris and ciliary body. Half of anterior chamber was filled with cheesy mass.

Case XXX.—Hippel (*Trans. Ophth. Soc. Heidelberg*, 1893, p. 86). Girl, aged twenty-five years. Serous iritis, hazy vitreous. *Yellowish* nodules in iris; later a second nodule appeared in iris, which grew into the first nodule; entire lower periphery of iris was involved. After three weeks the growths began to diminish in size without any treatment having been employed. The injection of globe disappeared entirely. A month later iris appeared normal. Tumor returned three months later.

REMARKS.

The older ophthalmologists regarded the eye as exempt from invasion by tubercle. Schüffel[1] was the first observer to prove that true tubercle sometimes occurs in a limited part of the body without invasion of the entire organism, *i. e.*, in scrofulous hypertrophied lymph glands, in scrofulous ulcers of skin, etc. These observations were confirmed by Friedländer, Körster, and many others. These observations established the doctrine of local tuberculosis. In recent years much has been written to strengthen this doctrine. Northrup's[2] records of autopsies bearing on the question of primary infection show that the primary seat of tuberculous infection was in bronchial lymph nodes in a great majority of cases. In thirteen out of one hundred and twenty-five cases the tuberculous process was limited to these nodes alone. One of the most interesting and valuable contributions to this question is by Dr. Ira Van Giesen, of New York. It relates to a case of phosphorus poisoning, in which he examined all the organs of the body. He found miliary tubercles in only one of the bronchial glands and nowhere else.

Structural Type of Tubercle.—Virchow[3] defined tubercle as follows: "Tubercle is a small spherical growth, always proceeding from connective

[1] Schüffel, Untersuchungen über Lymphdrüsenluberkelose, 1871.

[2] W. P. Northrup, N. Y. Medical Journal, February 21, 1891.

[3] Virchow, Die krankhaften Geschwülste, 1865, Vol. II., p. 385.

tissue, and consisting of small round cells, closely crowded together. The life of this neoplasm is a limited one. A degeneration of its elements very soon begins, and always first in the middle of the spherule. In most cases the result is a cheesy deposit. Aside from this local character, the neoplasm possesses another, which necessitates its classification among the malignant tumors, *i. e.*, a decided tendency to spread throughout the entire organism." Later Cohnheim endeavored to supplant Virchow's anatomical definition by an etiological one. He said, "Everything is tubercle which when so inoculated will produce tubercle." Pathologists have elaborated Virchow's definition. Thus, they have described the tubercle as consisting centrally of either one or more multinucleated giant cells, or some granular débris surrounded by giant cells, with usually, but not constantly, large connective-tissue cells, with large nuclei and granular protoplasm (epitheloid cells) situated outside of the giant cells, and external to these, a zone of lymphoid cells. Longham found giant cells almost constantly present in tubercles, and claimed that their presence was typical, *i. e.*, that the giant cells had a peculiar nature which distinguished them from those formed elsewhere. Köster[1] discovered the epitheloid character of the cells surrounding the giant cells, and Cheyne and others maintained that the epitheloid cells are the more characteristic as they are the more constant. Stress was laid, not alone upon the presence of giant cells in tubercle, but upon the supposed peculiarity of this form of cell, consisting in the arrangement of the nuclei. Later investigators have shown that no one of these or other definitions strictly applies to tubercle. Thus, we know that the morphological characteristics of tubercles and syphilitic inflammation may so closely resemble each other that they cannot be differentiated; furthermore, we know that there may coexist in the same individual a mixed tuberculous and syphilitic process. Therefore, pathologists no longer lay the same stress upon the varieties in structure of tubercle. Koch's discovery of the *Bacillus tuberculosis* in 1882 gave to the anatomical picture of tubercle a conclusive diagnostic feature; for the medical profession has long since accepted the *Bacillus tuberculosis* as conclusive proof of tuberculous infection when found in the tissue of the body, no matter how puzzling the structural change may otherwise be. Samelsohn's case, above quoted, shows how little reliance can sometimes be placed upon the anatomical diagnosis.

Primary and Secondary Tubercle in the Eye.—It appears that E. von Jaeger[2] recognized tubercle ophthalmoscopically in 1855, and that the diagnosis was verified post mortem. A little later Manz[3] found tubercles in the choroid post mortem. But A. von Graefe and Leber[4] were perhaps the first observers to diagnose tubercle positively in the living eye

[1] Koster, Virchow's Arch., XLVIII.

[2] Jaeger, Oesterreichische Zeitschrift f. praktische Heilkunde, 1855.

[3] Manz, Arch. f. Oph., 1858, Vol., IV., 2, p. 120.

[4] A. von Graefe and Leber, Arch. f. Oph., 1868, Vol. XIV., p. 183.

(choroid). However, the disease of the eye was not primary in these cases, nor has it been shown to be since. A careful analysis of the cases of tubercle which I have tabulated above shows that there is no positive evidence that the iris was the primary seat of tubercle in any instance. An autopsy has not excluded, even in the most favorable case, the possibility of a latent tuberculosis.

Diagnosis.—According to the descriptions furnished by the published cases of tubercle of the iris, the growth consists of one or more nodules, varying in size from that of a pin's head to that of a small pea or even larger, the color being *light yellowish white* or *light grayish white* or *light grayish yellow;* usually no vessels are seen on the surface of the growth, although in some instances they have been present. There is generally little or no pain, and there is usually very little injection of the conjunctival vessels of the globe. In a few instances there was considerable reaction, due to a blow or some other cause not explained. The disease may begin as a *serous* or *adhesive irido-cystitis.* The course is generally insidious. The development of tubercle may be almost without reaction.

Differential Diagnosis.—Tubercle may, under certain circumstances, be confounded with *primary sarcoma* or *syphilitic gumma* of the iris. In the early stage of sarcoma of the iris, when there is no increased tension nor injection of the scleral vessels, it may be difficult to decide, although the color of sarcoma of the iris resembles more that of gumma. Tubercle is of more rapid growth than is sarcoma of the iris. The color of sarcoma of the iris is *reddish gray*, *blackish*, *light brown*, or *flesh-color.* The color of tubercle has been given above. Sarcoma of the iris occurs between the ages of twenty-four and sixty[1], whereas tubercle, according to the recorded cases, occurs in young subjects, *i. e.*, between the fourth and twenty-first year; in one instance it occurred in a man fifty-one years old. From gumma it should be easy to distinguish it. The color of gumma is either an *iron red* or a *deep yellowish red.* Gumma is always accompanied by considerable reaction, and there are generally other signs of syphilitic infection. Haab and others have laid stress on the location of the tubercle in the iris, *i. e.*, that it selected the inferior part of the iris, but this circumstance is of no diagnostic value whatever. I have seen syphilitic gumma at the pupillary margin, at the periphery of the iris, and between the pupillary margin and the periphery. The same appeared to be the case in tubercle.

Prognosis.—It appears from Leber's case that when the eye is enucleated in the absence of other signs of tubercle elsewhere in the body, the prognosis is not unfavorable. In this case the patient was reported well six years after the operation. In Higgins' case the patient was reported "strong and healthy" one and one-half years after enucleation. There are

[1] Primary sarcoma of Iris, by Jas. A. Andrews, M.D., New York Med. Jour., June 1, 1889.

no definite data beyond a few weeks as to the condition of the patients who have been reported cured after the iridectomy for excision of the tubercle. Such patients had been observed too short a time after the operation to justify the opinion that they remained free from tuberculous infection. Liebrecht and Leber recognize an "*attenuated tuberculosis of the iris*," but this depends on the patient's powers of resistance to the *Bacillus tuberculosis*. We cannot define what the conditions are in such instances.

Treatment.—When the tuberculous process is limited to a small area of the iris, does not encroach upon the periphery, and there are no signs of tuberculous disease elsewhere in the body, the patient should be given the benefit of the doubt as to the disease being primary in the iris, and an iridectomy should be performed including the growth in the portion of iris excised. When the disease is extensive and involves the ciliary body, and signs of tuberculosis elsewhere in the body are absent, the eye should be enucleated. In either event the patient should receive such constitutional treatment as tuberculosis calls for. When there is evidence of meningitis or pulmonary disease, or phenomena pointing to tuberculous disease in some other part of the body, neither iridectomy nor enucleation can be of any avail, for in such cases it is evident that the eye lesion is not the principal seat of infection.

FOREIGN BODY FROM THE STOMACH OF A BOY.[1]

BY FRANK WHITE, M.D.,

One of the Assistant Physicians to the Pennsylvania Training School for Feeble-Minded Children.

In looking up the literature on this subject I find many cases reported by surgeons; many were cases of insanity of the acute forms, others were old melancholias. The cases reported were operated upon, and the mortality was remarkably low, in view of the fact that in most cases the foreign body had remained in the stomach for some time previous to surgical interference. No attempt has been made to report the many cases of swallowing of false teeth, coins, buttons, etc., that are frequently seen in hospitals, and usually need nothing more than a little time and care in diet, foreign body soon passing away without producing any special discomfort and apparently without inducing any serious injury to the gastro-intestinal tract. We have records of cases occurring among idiotic children who have been known to eat grass, leaves, "shell-barks," etc.

The question of an operation on this boy was not considered, inasmuch

[1] Specimen was exhibited before the Philadelphia Pathological Society, January 28, 1897. I am indebted to Dr. Joseph Sailer for the post-mortem notes, to Dr. W. G. Spiller for assistance in obtaining the literature on the subject, and to Dr. M. W. Barr for the privilege of reporting the case.

as he had general tuberculosis, probably many months before our knowledge of the foreign body in his stomach.

In view of the fact that the brain of this boy is to be further reported upon by Dr. Sailer, I have given only a few points taken from our etiological blank and a few of the clinical notes connected with the case.

J. L., aged fifteen. The history of the case is as follows: He was born at full term; labor difficult. There was deficient animation at birth; he was nourished by his mother. He had a great deal of gastro-intestinal trouble; also had convulsions from about the second week until the third month after birth. He did not walk until two and one-half years old, and never talked except during the last year of his life; he could say possibly half a dozen words indistinctly. He was generally inactive, never becoming interested in any games, nor did he take part in any of the exercises in which other children found so much delight. He was at times cross and irritable, easily angered, and when in this condition was usually quite indifferent to all requests and commands. He spent most of his time walking slowly around, picking up any little thing he could, and seemed to be in fear of some one seeing him. Indeed, he has been known to watch certain things for some time, and, when no one was looking, quickly pick up the desired object, then, concealing it in his clothing, go to some other part of his play-room, and, if unnoticed, seem to enjoy playing with this attractive article, whatever it may have been. A preference seems always to have been displayed for such things as threads, strings, etc. Another peculiarity early manifested in this child was his distaste for any line of food except milk and crackers, and one might truthfully say that in later life this distaste had grown into a decided aversion to any and all other forms of food. He was unusually old in his appearance; his expression was rather pathetic; he had insufficiency of both internal recti muscles, also a considerable degree of myopia, but, unfortunately, a careful examination of the eye-ground had never been made. His head was mesocephalic, lips and ears adhering to his face, and he had a deep, narrow hard palate, irregular, decayed teeth, and some tonsilar enlargement. His gait was rather unsteady; patella-tendon reflex (?) increased; power of coördination very poor. The father and mother of this child are of English parentage. The father is a stonecutter and fireman, and is of scarcely average intelligence; but the mother, although rather nervous, is quite bright, and does not seem to be in any way mentally defective. The mother's grandfather became epileptic and insane rather late in life; he had two sisters who died insane. The mother's father became an epileptic when middle-aged, and he had one sister who became insane before middle life. The mother had three sisters, two of whom became insane and died before the age of thirty. A peculiar analogous condition has existed in the different generations ending, as is not unusual, in idiocy. No brothers, so far as we have been able to ascertain, have developed any form of insanity. The great-grandfather and great-grandmother were cousins.

J. L. was admitted to the Pennsylvania Training School for Feeble-Minded Children, October 3, 1886. His mother stated that he had always been rather delicate. He was indolent, untidy in his habits, and had a great desire to eat sticks and strings. He had always been peculiar about his diet, and objected to almost everything except liquids or semi-solids. He had measles when five years of age; since that time he had required no treatment except for a few minor troubles.

My attention was called to him on October 2, 1896, for gradual emaciation and diarrhea. Under treatment the diarrhea was relieved for a few days, only to start again with increased severity.

October 10.—The movements at this time were frequent, watery in consistence, and followed by considerable pain. The case was looked upon as one of general tuberculosis, with probably tuberculous enteritis. On his admission to the hospital, October 12, he was much emaciated; his temperature ranged from 101° to 103° F. The heart was rapid; the pulse at the wrist was very feeble. His eyes were congested; vessels extremely tortuous; some photophobia, also convergent strabismus of both eyes.

October 19.—The temperature was normal. The heart was extremely slow and irregular, pulse ranging between 55 and 68.

October 20.—Temperature subnormal. Respirations were slow, regular, and moderately full. Pulse less irregular.

October 21.—Temperature normal. Eyes were less congested. Feet were swollen, showing venous stasis. Twitching of the eyelids; rolling of the head; strabismus absent.

October 22.—The vessels of the eyes were much smaller and less tortuous. The general lethargic condition passed into one of coma, which ended in death.

Autopsy, December 15, 1896, 2:30 P. M. Male, white, aged fifteen years, died 6 A. M., December 14, 1896.

Body greatly emaciated, feet and legs edematous, abdominal veins distended, gluteal regions bright red; anus directed backward, as a result of the formation of a right angle by the sacrum with the axis of the spinal column. Testicles still in inguinal canal. Post-mortem discoloration of abdomen; post-mortem lividity. Spinal canal contains edematous cellular tissue and considerable fat; the cord apparently normal, the lower part very firm in structure; calvarium thin and dura mater thick. Over both temporal regions the pia is very edematous and the vessels are injected. Beneath each temporal region, apparently in the arachnoidal space, is a large multilocular cyst filled with a clear fluid. The pia which forms the floor is thickened and covered with trabeculæ, and the convolutions of the temporal sphenoidal lobes are compressed and the sulci shallower. The cerebral arteries and all the vessels of the base lying anteriorly to these cysts are intensely injected, and the vessels lying posteriorly are depleted. The abdominal organs are normal in arrangement. Diaphragm, right; at fourth rib, left; at third, interspace. The sternum is adherent to the right pleura by granular and purulent adhesions; the left pleural cavity contains no adhesions; but the visceral layer is covered by fine miliary tubercles. The superior mediastinum is filled with greatly enlarged glands that surround the vessels and the trachea, slightly compressing the latter. The pericardial fluid is normal in amount and the epicardium normal. The foramen ovale is not patulous; the tricuspid valve admitted two fingers and the mitral valve admitted one finger. The endocardium of all cavities is normal; the myocardium contains a few cicatrices. Upon the epicardium over the left ventricle anteriorly near the base, there is a single white nodule dipping into the myocardium; the left lung contains numerous tubercular nodules of various sizes, the majority being miliary, a few large and undergoing cheesy degeneration. The bronchial glands are enlarged and cheesy; the right lung is surrounded by a greatly thickened pleura that is undergoing cheesy degeneration without cavity formation, and enormous numbers of miliary tubercles. The upper and lower surfaces of the right half of the diaphragm are covered with large cheesy nodules extending deeply into the substance of the muscle. The spleen is small and firm; capsule pale, and in parts adherent to the abdominal wall; there are three deep notches on the lower edge. The left kidney is of normal size; capsules strip readily. Relation between cortex and medulla normal. Cortex pale;

pyramids distinct. A recent anemic infarct in cortex. A small white nodule in the substance. The pelvis is normal. The right kidney is of the same general condition, but there are neither tubercles or infarcts. The suprarenal bodies show considerable fatty degeneration of cortex. The pancreas is very dense and apparently sclerotic. The stomach is enlarged and filled with a solid mass, which, upon being opened, proves to consist of wood, straw, grass, and string; its weight is six and a-half ounces; its length, five and one-half inches; thickness, two and one-half inches; firmly agglutinated and moulded to the form of the stomach; towards the cardiac end the wall of the stomach is greatly thickened and slightly dilated. The small intestines show two white nodules; they contain feces, and the ileum is intensely congested. The mucous membrane of the large intestines in a few areas is thickened and slightly eroded. There are neither tubercles nor ulcers. The lymphatic glands of the mesocolon are greatly enlarged, and the corresponding part of the colon is injected. The liver is pale and contains a few hemorrhagic infarcts. In the capsule are some miliary tubercles. The ascending cava just above the junction with the hepatic vein contains a thrombus that is adherent to the wall in both directions, and no adherent secondary thrombi are found in the vein. The thrombus contains no areas of softening. The bladder walls are thickened and slightly rugous.

Pathological Diagnosis.—Tuberculosis of the lungs; general miliary tuberculosis; cheesy tuberculosis of right lung, right pleura, and right diaphragm; tuberculosis and caseation of superior mediastinal glands; obstruction of gastric lumen by slowly forming foreign bodies, with hypertrophy of wall at cardiac end; renal anemia; renal and hepatic infarcts; tuberculous mesenteric glands; thrombosis of the ascending cava *ex-cachexia.*

LITERATURE.

1. Med. Exam. Pha. Juax. Cat. of the Surgeon-General's office, 1884. Neal operated on a patient, removing a large piece of lead, curing the case.

2. Berliner klin. Wochenschrift, 1880, p. 539. Belle reports the case of a man, aged 58, who had a self-made cleansing apparatus for the pharynx, which in some manner became broken, was swallowed, and remained in the stomach sixteen hours. First an esophagotomy was done, then a gastrotomy; death followed in five days. Length of wire 31½ centimetres.

3. Medical Press and Circular, October 12, 1881; Virchow's Jahresbuch 1881, II., p. 40. Fleury reports the case of a man aged 42, who while playing with a fork swallowed it. The prongs stuck into the muscular wall of the stomach; the handle also was impacted. The fork was in the stomach two months; operation was followed by recovery.

4. Bulletin de l'Académie de Medecin, August 24, 1886. Solallion reports a case; a man aged 25, swallowed a fork 21 centimetres long, and weighing 59 grammes. Fifteen days afterwards a position diagnosis was made with an electro-magnet; operation; no change in stomach walls; cured.

5. Lancet, 1891, I. 249; British Medical Journal, 1893. Report of a case by Lansen, of an insane man aged 37, who tried to commit suicide by swallowing a wire 7½ inches long, also the handle from a clay pipe 2½ inches long. Length of time foreign body was in stomach is not given; he was operated upon and cured.

6. Boston Medical and Surgical Journal, 1886, Vol. II., p. 569; Centralblatt f. Chirurgie, 1887, No. 47. Richardson reports a man as having swallowed (during sleep) four front teeth from the left upper jaw. These teeth remained in the stomach eleven months; at the time of operation no changes were found in the wall of the stomach; cured.

7. St. Louis Medical and Surgical Journal, 1887; Berliner klin. Wochenschrift. Beranays reports a German tailor and sword swallower, aged 28, who swallowed a knife 24 centimetres long; it remained in the stomach a few hours; operation; cured.

8. Langenbeck's Archiv, 1887, 37, p. 283. Stetzner reports a man aged 25, who was arrested for attempting to commit suicide; six pieces of wood from eight to ten centimetres long and from three-fourths to one and one-half centimetres thick remained in the stomach 23 days.

9. New York Medical Journal, 1887, Vol. II., p. 481. Bull reports the case of a boy, aged sixteen; a peach-stone was swallowed and lodged in the esophagus under the heart. Nine days afterwards an opening was made in the stomach, an instrument containing a sponge was introduced into the esophagus, and the foreign body was removed through the mouth.

10. Nord. med. Arkives, 1888; Schmidt's Jahresbericht, 218. Berg reports a case having swallowed a bunch of hair weighing 900 grammes; time not given; operation; cured.

11. Journal American Medical Association, 1888; Centralblatt f. Chirurgie, No. 48. Witte reports a woman, aged 31, who during an attack of acute mania swallowed a four-tined fork, 7½ inches long, which remained in the stomach three months. Perforation of the anterior wall of the stomach; operation; cured.

12. Bulletin de Chirurgie, 1889, p. 436; Virchow's Jahresbericht, 2, p. 524. Ferrier reports a butcher boy, aged nineteen, who swallowed a fork 22 centimetres long, while trying to push a piece of orange down the pharynx; 24 hours afterwards an operation was performed; cured.

13. Langenbeck's Archiv, 1889, Vol. XXXVII., p. 169. Hashimoto reports a hair-dresser, aged 36, who swallowed a Japanese tooth-brush, which was about the thickness of a lead-pencil. The brush remained in the stomach ten days; the anterior wall was perforated; operation; death on the third day from peritonitis.

14. Skearek, Inaugural Dissertation, Bonn, 1889. Trudelluburg reports a case of a man having swallowed a set of false teeth, which remained in the stomach a few hours; operation; cured.

15. Gugutta Hôpitaux, No. 51, 1890. Virchow's Jahresbericht, 2, p. 514. Periar. A German, aged 32, swallowed a German spoon, which remained in the stomach 24 days. Diagnosis made with an electro-magnet; operation; cured.

16. Boston Medical and Surgical Journal, 1890, 123, 8, 177; Virchow's Jahresbericht, 2, p. 514. Richardson reports a woman, aged 31, having swallowed an open safety-pin; it lodged in posterior wall of stomach for four days; operation; cured.

17. Semaine Medicalé, 1891, Schundt's Jahresbucher, 232, p. 174. Nuncy and Heidenrich report a man, aged 29, a sword swallower, who swallowed a silver spoon 20 centimetres long; weight 27 grammes. It was in the stomach fourteen days; operation; cured.

18. Johns Hopkins Hospital Bulletin, October 3, 1892; Virchow's Jahresbericht, p. 1447. Finney. A man, aged 49, swallowed a peach-stone, which lodged in the esophagus; it was removed through the stomach. Length of time in esophagus five days; operation; cured.

19. Lancet, 1893, I. p. 20; Centralblatt f. Chirurgie, 1893, No. 36. Cant reports that a woman with suicidal mania swallowed a razor; in stomach six days; operation; death on the fifth day from hemorrhage and abscess of the stomach wall.

20. Lancet, 1894, I. p. 734. Wallace reports that a woman, aged 28, during

sleep swallowed a plate of false teeth, which lodged in the lower part of the esophagus. The foreign body was removed by introducing an instrument into the esophagus through the stomach.

21. Lancet, 1894, II. p. 432. Geunnel operated on a patient, aged 43, suffering from chronic mania, and removed 192 nails and a large bunch of hair, weighing one pound and nine and one-half ounces. Front wall of stomach much eroded, but not perforated. The nails were in numerous places impacted in the walls of the stomach, necessitating extensive dissection. Death followed in four hours, from shock.

22. Girl, aged ten years, swallowed 42 iron nails, 93 brass and lead sticks, twelve large nails, three shirt buttons, a safety-pin, and a needle. No changes in stomach wall; cured.

23. Deutsche med. Wochenschrift, 1894. Czerney reports that a laborer, aged 32, swallowed three closed pocket knives; in stomach 40 hours; no changes in stomach wall; cured. He afterwards swallowed two knives.

24. Lancet, April 6, 1895, p. 904. Kenge Hottz. Swain reports the case of a girl, aged 20, who swallowed a bunch of hair weighing five pounds and three ounces; no change in stomach walls; cured.

25. Centralblatt f. Chirurgie, 1895, p. 4. Aufschulen reports that a woman, aged 30, who weaves cowhair, swallowed a bunch of hair 7.006 centimetres in diameter; weight 120 grammes. No changes in stomach wall; extended growth within the peritoneum; cured.

26. Annals of Surgery, April, 1896, p. 415; Norton, Centralblatt f. Chirurgie, No. 28. Bristol reports the case of a man, aged 27, who swallowed a plate with two upper front teeth; in the stomach a year and three-quarters; death on the seventh day, of peritonitis.

27. Centralblatt f. Chirurgie, No. 31. Pheltzuem reports the case of a girl, aged seventeen, with the habit of biting off her own and other girls' hair plaits, swallowed a bunch of hair the size of a goose egg, weighing 180 grammes; no changes in stomach wall; cured.

REVIEW OF MEDICINE.

MEDICINE.

Clinical Observations upon Acute Leukemia. (*Deutsche med. Wochenschrift*, July 1, 1897.) By Professor A. Fraenkel, of Berlin.

A characteristic of acute leukemia is the hemorrhagic diathesis which is associated with swelling of the glands, spleen, and liver, and with peculiar blood changes. Fraenkel has seen twelve cases in seven years. Many cases were mistaken for purpura hemorrhagica until the blood examination revealed their true nature. Typical heteroplastic leukemic growths occur in the liver and spleen. The blood changes are entirely characteristic. There is a remarkable increase of the mononuclear elements, which are of the most varying sizes, but do not contain neutrophilic granules. Fraenkel calls these cells lymphocytes (not identical with the variety usually so called) and the condition "acute lymphocytemia." One of Fraenkel's

cases exhibited the following interesting features: peripheral facial palsy, which was the result of leukemic deposits in the nerve trunk; the relation of the whites to the reds was as low as 1 to 94, and the urine contained the enormous quantity of twelve grammes of uric acid in forty-one hours. The proportion in the blood itself was 22 m. g. in 100 c. c. of blood. The above is abstracted from the abstract given in the Proceedings of the Congress for Internal Medicine in Berlin.

STEELE.

Remarks upon the Antitoxin of Tetanus. (*Deutsche med. Wochenschrift*, July 1, 1897.) By Professor W. Dönitz, of Berlin.

After a series of experiments undertaken to decide whether the poison of tetanus can be neutralized by antitoxin after it is in combination with the tissues, the writer concludes: 1. The poison commences to be taken up by the body tissues as soon as it enters the blood. 2. In cases of severe poisoning from four to eight minutes are sufficient for the absorption of the fatal dose. 3. The toxin that is already combined with the tissues can be neutralized and rendered harmless by the specific antitoxin. 4. The chances of successful neutralization depend upon the length of time that has elapsed between its administration and the injection of the poison, and also upon the amount of toxin given. Dönitz has found that the amount of antitoxin required is in direct proportion to the number of minutes between the injection of the poison and that of the antitoxin. The serum is a true remedy for disease, since it attacks the agent after its assimilation by the tissues. The next series of experiments were to show the action of antitoxin upon animals which had been infected by tetanus bacillus after they had developed the first symptoms of the disease. Six rabbits were so infected and after about forty-five hours commenced to show rigidity of the hind leg in the neighborhood of the wound. The antitoxin was given, and half recovered with a gradual decline of the symptoms. The rest died with signs of tetanus, as did invariably many control animals. The results with mice and guinea pigs were practically the same. These findings are in accord with those obtained in the antitoxin treatment of horses for tetanus. If the treatment was delayed until marked convulsions appeared, the animal always died. Dönitz also described a condition which he considers to be "tetanus a tetano," or tetanic cachexia, which occurred in rabbits only after the administration of small doses of the toxin. The rabbit sickens, but presents no characteristics of the disease. The same condition has been noticed in connection with diphtheria and the *Bacillus pyocyaneus*. He explains its appearance in rabbits alone of the usual laboratory animals by the supposition that the cells of the organism which are susceptible to tetanus poison have a wide distribution in those animals, while in the others such cells are entirely or almost entirely confined to the central nervous system. The article is interesting in that the data

given are in accord with the clinical failure of antitoxin in human cases of tetanus. The explanation, of course, is that such cases do not come under observation until the stage of severe rigidity or convulsions has commenced.

STEELE.

Observations on Broncho-Biliary Fistules. (*British Medical Journal*, June 5, 1897.) By J. E. Graham, M.D., of Toronto.

Two cases are reported. The first patient was a man aged thirty-three years, who, during an attack of hepatic pain and enlargement (without jaundice) accompanied by signs of an acute right-side pleurisy, began to cough up a greenish material that chemical examination showed to be pure bile. After about ten days the discharge ceased, and the patient was not troubled again for ten years. Then, after a return of all of the above symptoms, cholecystenterostomy was performed. The gall bladder was packed with gall-stones, which partially occluded the cystic and extended into the common duct. Death occurred on the twelfth day, with intense jaundice and the signs of pneumonia. G. quotes twenty-four cases of broncho-biliary fistula collected by Courvoisier, to which he has added ten. Of Courvoisier's cases six recovered. In three of these the obstruction was caused by hydatids and in one by calculus. Of the eighteen fatal cases ten were cases of cholelithiasis, six of echinococci, and two of ascarides. Of G.'s cases eight were due to calculi and two to echinococci. The diagnosis of the condition is based on the amount and purity of the bile expectorated, as there are cases of bronchitis and pneumonia with jaundice in which the sputum is tinged with bile. The physical signs were very uniform in all the reported cases. There is dulness extending to the third interspace above, to the right often as far as the mid-axillary line, and to the sternum on the left. Bronchial breathing and bubbling râles are usually heard over this area. The cough is usually distressing. The fistula may originate: (1) in occlusion of the common bile duct by a calculus, followed by a liver abscess with adhesion to the diaphragm and lung and ulceration through; (2) interhepatic calculi may form, with the same result; (3) ulceration caused by calculi from the larger bile ducts or gall bladder into the lung; (4) rupture of an inflamed gall bladder, formation of a circumscribed abscess between the liver and the diaphragm, and perforation. The pressure of the diaphragm downward in respiration favors the upward flow of the bile. Case II. was that of a man aged twenty-three years, who had been perfectly healthy up to the time of an accident in which he was kicked by a horse in the hepatic region. At the end of four days pneumonia developed in the lower lobe of the right lung. This pneumonia did not entirely resolve, and a pleural effusion developed. A week later the patient commenced to cough up bile. The pleural sack was aspirated, and one and one-half pints of bile containing serum and pus were withdrawn; a

drainage-tube was inserted, and the wound discharged freely. The bile expectorated increased in amount after the operation. An area of dulness appeared over the line which was aspirated and a pint of bile and mucus withdrawn and a drainage-tube inserted. The two openings did not communicate, as shown by the injection of fluids. At different times for a month the patient discharged bile through the two tubes and by expectoration. In this case it is probable that there was partial occlusion of the common duct, a communication between the bile ducts and the pleura and bronchi, and a distended gall bladder or a communication between it and a cavity below the diaphragm. STEELE.

The Symptom-Complex of Reichmann; a Critical Exposure of Recent Works upon Hypersecretion of Hydrochloric Acid. (*Gazette des Hôpitaux*, May 27 and 29, 1897.) By Jean Charles Roux.

After a study of the subject the author concludes: 1. It is poor policy to say symptom-complex of Reichmann or Reichmann's disease. 2. It is an exaggeration of facts to regard the symptom-complex of Reichmann as being always the clinical expression of a motor insufficiency of the stomach (Schreiber) almost exclusively dependent upon an incomplete organic stenosis, pyloric or sub-pyloric (Hayem). 3. In the majority of cases, an exaggerated secretory excitability of the mucous membrane of the stomach should be admitted. Before the appearance of the symptom-complex of Reichmann the patients were hyperchlorhydrics. 4. The existence of the symptom-complex of Reichmann should only be recognized when, in the course of a test-meal given after previous lavage, the presence of a marked increase of free or combined hydrochloric acid is demonstrated. The examination of the fluid obtained early in the morning should not suffice to establish this condition, as the author understands it. 5. The symptom-complex of Reichmann may be observed accompanying a permanent or a transitory dilatation of the stomach, whether there are or are not material lesions of that organ, particularly lesions in the pyloric region. Such lesions may be acute or chronic ulcer and even cancer of the pylorus; consequently, the disease may be either transitory or permanent in character. 6. There is a form of the passage of simple into continuous hyperchlorhydria. 7. However that may be, stasis should be credited with a very important rôle in the development of the symptoms; if it is not sufficient to give rise to the symptoms it is certainly sufficient to prevent the considerable amelioration or even the complete cure of these symptoms. Stasis carries with it, therefore, an indication of the first importance for medical and surgical therapeutics. SWAN.

On the Absorptive Power of the Bladder. (*Zeitsch. f. kl. Med.*, Vol. XXXIII., Nos. 1 and 2.) By Morrow and Gaebenbein.

The previous studies of this question have given very contradictory

results, which the authors attribute in many, which were negative, to the nature of the experiments. Their own studies were conducted upon dogs. After complete narcosis with morphine they opened the abdomen, tied the ureters, washed the bladder and fully emptied it, closed the wound, and injected, per urethra, exactly determined quantities of numerous solutions. The dogs were kept partially narcotized during certain periods of time, after which they were killed and the entire contents of the bladder recovered. Glucose, sodium chloride, urea, and alcohol were absorbed in large quantities in strong solution, in lesser quantities in weaker solution. Boric acid and calcium chloride were freely absorbed; in one case the solution of the latter substance injected without narcosis or operation gave the same result as with those procedures, showing that they did not affect the result. Morphine showed practically no absorption. Quinine was freely absorbed, while cocaine and carbolic acid showed such extensive absorption as to serve as a warning against their free use in diseases of the bladder. With all solutions water was secreted in quantities directly proportioned to the strength of the solution and the amount absorbed. Sodium chloride was secreted in small amounts in the trials of alcohol, boric acid, and calcium chloride. A critical review of previous experimental work precedes the report of the authors' investigations. EDSALL.

THERAPEUTICS.

I. Local Changes After Intramuscular Injections of the Salicylate of Mercury. (*Archiv für Dermatologie und Syphilis*, Vol. XXXIX., No. 2, 1897.) By Max Wolters, M.D., of Bonn.

II. Pulmonary Embolism After Injections of the Salicylate of Mercury. (*Ibidem.*) By Bernhard Schulze, of Kiel.

I. The patient, a male, aged twenty-four years, afflicted with syphilis, had received six injections of the salicylate of mercury, the last one having been administered three months before death. The spots where the injections had been administered were isolated, and were marked by small, deep-seated nodes. In one of the author's cases these circumscribed areas were plainly to be felt one year after the injection. After the secondary symptoms were well marked 0.06 grammes of 10% suspension of hydrargyrum salicylicum was administered every three or four days. The syphilitic phenomena disappeared so rapidly that only six injections were required to cause the disappearance of the syphilitic phenomena. Loss of sleep and strength, and numbness of the extremities occurring soon after, the patient was ordered medium doses of potassium iodide; the nervous symptoms grew worse, and the diagnosis of polyneuritis was reached by the neurologists. Branner, who studied the case microscopically, was unable to arrive at a conclusion whether the neuritis was due to syphilis, mercury, or a combination of both. No mercury was discovered at the post-mortem three

months after the last injection, but many persistent canals surrounded by normal muscular tissue and containing hyperplastic sarcolemma were seen. II. A typical case of syphilis was treated four times with deep injections of 1 c. c. of a 10% liquid paraffin solution of the salicylate of mercury. Five minutes after the last injection had been given the patient was seized with dizziness, chilly sensations, long continued coughing spell, vomiting, and sharp stabbing pain in the region of the left lung. A sleepness night was passed with high fever, almost continuous coughing, and marked pain in the left lung. When seen in the morning, the cough was not so severe, the breathing labored and superficial with continuation of the pain in the left lung. Râles were heard, heart normal. Temperature 39.2°C. Urine normal. Under rest the symptoms gradually disappeared, and the injections were again continued, the patient being cured by twelve injections representing 1.2 grammes of the salicylate of mercury. The writer thinks the symptoms are to be explained by a pulmonary embolism.

CATTELL.

A Study of the Physiological Action of Hydrochlorate of Eucaine. (*Bulletin de l'Académie Royale de Médicine de Belgique*, No. 4, 1897.) By A. Ver Eecke, M.D.

After a full experimental study of the physiological action of hydrochlorate of eucaine the author sums up the work on which he has been engaged as follows: 1. Hydrochlorate of eucaine in the frog determines successively excitations, convulsions, and paralysis; the latter is of peripheral origin. The return to the normal state is accompanied by convulsions, and later by hyperexcitability. The fatal dose is 0.16 grammes per kilogramme. 2. In the warm-blooded animals hydrochlorate of eucaine primarily produces excitation, which is followed by convulsions, and finally, death from asphyxia occurs. There is no paralysant dose. The fatal dose in the guinea pig is from 0.049 to 0.052 grammes per kilogramme. There is no cumulative action of the poison; on the contrary, the organism may accustom itself to increasing doses of the drug. Cocaine has twice the toxic action which is possessed by eucaine. 3. Hydrochlorate of eucaine acts on the heart principally by paralyzing the intracardiac motor centre; secondarily it alters the muscular fibre of the heart. 4. Hydrochlorate of eucaine lowers the blood pressure by diminishing the peripheral resistance. 5. Hydrochlorate of eucaine directly stimulates the respiratory centre in the medulla. The paralysis of the respiratory centre in cases of fatal poisoning is not the result of the direct action of the poison, but is due to asphyxia, which in its turn is caused by an excess of carbon monoxide in the blood. 6. Eucaine increases diuresis, accelerates nitrogenous, phosphorous, and chlorous metabolism; it produces glycosuria, but only during the presence of intense convulsions. 7. Hydrochlorate of eucaine does not appear to eliminate itself by the kidneys; on the other hand it

probably undergoes a chemical decomposition in the economy. 8. Hydrochlorate of eucaine, instilled in the conjunctival sac, first produces anesthesia of the conjunctiva, and finally, of the cornea at the same time that it rapidly lowers the intra-ocular pressure. 9. Hydrochlorate of eucaine reduces the vitality of the red blood corpuscles and produces fatty degeneration of the heart and of the involuntary muscles. 10. Choral hydrate diminishes or stops the convulsions produced by eucaine. Chloralization will allow the administration of doses of eucaine which are beyond the fatal limit. 11. The antagonism between hydrochlorate of eucaine and chloral hydrate is not reciprocated.

SWAN.

The Physiological Action of Extract of Liver upon Man in Health. (*Gazette des Hôpitaux*, April 27, 1897.) By Mairet and Vires, of Montpellier.

The authors have reported a summary of their work on the physiological action of extract of liver upon healthy men to the *Société de Biologie*. During the administration of this substance the temperature is lowered, the quantity of urine in twenty-four hours is increased, the excretion of urea and of phosphoric acid is increased in relatively considerable proportions, the stools become liquid and more abundant. When the ingestion of extract of liver is discontinued, these symptoms disappear.

SWAN.

Koch's New Tuberculin. (*Gazette des Hôpitaux*, June 1, 1897.) By Nocard.

In behalf of the serum commission, Nocard makes a report to the French Academy of Medicine on Koch's new tuberculin. The commission regrets the absence of experiments and clinical observations concerning the efficiency and the harmlessness of the preparation. The commission thinks that the new tuberculin should not be definitely authorized by the Academy until this efficiency and harmlessness have been established. In order to determine these facts the Academy should allow the preparation to be introduced into France, and should permit its sale on condition that it is completely sterile. The Academy adopted the report of the commission.

SWAN.

The Medicinal Prevention of Dental Decay. (*New York Medical Journal*, July 31, 1897.) By George H. Winkler, M.D., D.D.S., of New York City.

Winkler does not accept the views of Miller, Williams, and Black that micro-organisms are the sole cause of dental decay. He is convinced that while bacteria are present in all dental cavities, and are the direct cause of decay in some cases, the primary cause of dental decay in a majority of instances lies in a morbid state of the system which gives into the mouth

perverted secretions. The destruction of dental tissue by corrosive excretions from the gingival borders is at once arrested by the frequently repeated use of creosote in minute doses, covering a period of from one to three weeks. In a second class of cases the teeth are affected by decay, more or less extensive, which is characterized by a very light brown or chalky-white color and by rapid progress. The treatment here is not so well defined as in the first group, but the salts of mercury, of potassium, and of calcium, charcoal, creosote, etc., are the most potent. In the third class, due to acid-excreting bacteria which are lodged in sheltering localities about the teeth, operative interference is the only treatment. Cleanliness of the teeth and mouth and, when the presence of acid prevails, the use of milk of magnesia, especially at night on retiring is efficient in preventing decay. Winkler is persuaded that more than 50% of dental cases is absolutely preventable by medicines internally administered.

CATTELL.

The Action of Taka-Diastase in Various Gastric Disorders. (*New York Medical Journal*, May 29, 1897.) By Julius Friedenwald, M.D., of Baltimore.

Friedenwald ends an interesting experimental paper on taka-diastase with the following conclusions: 1. That taka-diastase exerts no influence under normal conditions upon gastric digestion nor upon cases of nervous dyspepsia with normal motor and secretory functions. 2. That in cases of motor disturbances of the stomach with normal secretory functions, such as atony, taka-diastase increases the motor action without in any way influencing the secretory function or the digestion of starches. 3. That in cases of subacidity taka-diastase acts differently, according to whether there is a catarrh or a nervous dyspepsia. In nervous cases it has no effect whatever upon digestion, while in cases of catarrh it appears to have a tendency to increase the flow of acid and promote the digestion of starches. 4. That taka-diastase exerts its most favorable influence in cases of superacidity. It not only promotes the digestion of starches in these cases but diminishes the excess of acid and increases the motor function. 5. That taka-diastase in a great measure replaces the saliva when this secretion is diminished or absent. It then not only digests the starches in the stomach, but serves the other function of the saliva in stimulating the gastric secretion and therefore promoting the proteid digestion.

CATTELL.

Sciatica Treated by Hypodermics of Glycerophosphates. (*Bulletin de Thérapeutique*, May, 1897.) By Albert Robin.

Three solutions are employed by Robin: (1), a 25% solution of sodium glycerophosphate; (2), a solution of the same strength composed of the glycerophosphates of calcium, magnesium, potassium, and sodium; and (3),

a solution containing in addition the glycerophosphates of iron. The first solution is to be preferred. After sterilization and using ordinary antiseptic precautions one cubic centimetre is injected; this dose may be increased to 4 c. c., but 2 c. c. may be cited as the usual dose. The injection is to be made deep down in the muscular tissues in the region of the sciatic nerve, and to be given slowly. In 63 cases treated by Robin the results were rapid and surprising; 41 were cured, 18 benefited more or less, and 4 failures.—*Gazette médicale de Liége*, July 15, 1897.

CATTELL.

SURGERY.

Operative Treatment of Prostatic Hypertrophy. (*Nouveau Monpelier Médical*, No. 2, 1897.) By Dr. de Rouville.

The author delivered a clinical lecture on this subject over a patient with the following history: He is 76 years of age and has suffered with symptoms of an enlarged prostate for several years. Retention has gradually increased, until at the present time it has become absolute. Catheterization was easy; the prostate was about the size of a mandarin and of a generally hard consistency. As the patient grew worse under palliative treatment, more radical measures were advised. The author practised a double castration from the result of which the patient died thirty-five days after operation. The autopsy revealed the fact that there was no modification, either macroscopically or microscopically, in the size of the prostate. de Rouville believes the proper treatment of hypertrophied prostate rests in proper medical attention, hygiene, and catheterization. Sometimes, however, complications arise through no fault of the surgeon which demand more radical interference. These complications are chiefly retention of urine and infection. The bladder not evacuating its contents, catheterization becomes painful and sometimes impossible. Of the more radical measures, he classes hypogastric puncture and superpubic cystotomy together, as being the palliative procedures, and prostatectomy, castration, and resection of the vas deferens, as the curative procedures. He recommends hypogastric puncture as an excellent method in urgent cases, where the patient must be relieved immediately; it is followed, he claims, by relief of the atrocious pains. He believes persistent retention to be, however, a contra-indication for the continuous employment of hypogastric puncture. Of the curative procedures above mentioned, de Rouville prefers prostatectomy performed through the hypogastrium; and claims that in cases where infection is absent the results are generally favorable. Poncet extended the field of indications for this procedure first to all cases with fever, general symptoms of urinary intoxication and infection; second to all cases of retention without infection where catheterization was impossible, difficult, or dangerous. The author next discusses the pathogenesis of reten-

tion of urine in prostatics. He refers to two theories; one which attributes it to hypertrophy of the prostate, the other to general arteriosclerosis in the walls of the bladder. De Rouville himself believes both to play a part in the etiology of retention. He believes in the attempt to effect a radical cure by removal of the obstacle to micturition, and preserving or restoring the contractility of the bladder. Prostatectomy is therefore in his opinion a rational surgical procedure; its results are sufficiently numerous to demonstrate its efficiency. The indications for this procedure, he says, are slightly advanced age, a partially hypertrophied prostate, and a bladder supplied with sufficient contractility. When all the lobes of the prostate are involved this operation is contra-indicated. The idea of applying castration to produce atrophy of the prostate, originated from the ancient conception of Velpeau, who drew a comparison between ovarian castration for uterine fibro-myomata and the removal of the testicles for enlarged prostate. de Rouville believes that Velpeau's conception is purely theoretical and cannot be proven by facts. There is no doubt, he says, that in a number of castrations practiced for hypertrophied prostate, there have been a number of favorable results; the point in question is, however, how does castration act on the hypertrophied prostate? To settle the matter positively, one must base his reasoning on purely scientific facts. He calls attention to the intimate connection between the prostate and the remaining part of the sexual apparatus and looks upon it as essentially a part of the same. Embryology, anatomy, and physiology agree in this respect. While experimentation has demonstrated that the prostate of a dog atrophies after castration, he does not think it fair to compare the results of operation on dogs or young men, to the effects that would follow operation on an old man with an enlarged prostate. After all, is atrophy of the gland the goal to be reached? Referring to the clinical histories and the pathological anatomy of the cases published, he has noted marked incoherency between the benefits derived from the operations and alterations in the structure of the gland itself. As for example, some cases, where the prostate has shown no signs of atrophy, either clinically or microscopically, have shown marked alleviation of suffering; other cases, where there has been marked atrophy of the prostate, have been followed by no postoperative modification of micturition. These instances prove that the action of castration is difficult to solve. He notes that two general results have followed the operation: one in which there has been rapid diminution of the gland; the other in which diminution has been gradual and progressive. In the first class he believes there is no doubt that the operation was not responsible for the atrophy. In these cases, increase of volume is dependent upon congestion and the result of the operation is chiefly to relieve the gland of this congestion. This result has been noted as following other operations than castration; as for example, simple catheterization, hypogastric puncture, or superpubic cystotomy. In those cases where

atrophy was gradual and progressive, no doubt true atrophy of the gland followed the operation. Pathological anatomy has helped us little in this respect. The reports of White, Griffiths, and Kelsey are practically negative, the glands removed from twenty-six hours to eighteen days after operation failing to show any atrophic degeneration. The mode of action of castration is therefore uncertain; the method has been employed in numerous cases indiscreetly, and the results published demonstrate that in many cases it has been abused. In a series of 111 cases collected by White in which double castration was performed, marked atrophy was noted in 87.2%, amelioration in 52% and the return of vesicular contractility in 66%. The mortality is, however, a serious objection. White places it at 18%, Albarran at 16.3%, and Burns at 28%. Resection of the vas deferens is less serious and equally efficacious; it is now seriously considered as a substitute for castration. Guyon believes that the physiological isolation of the testes by resecting the vasa deferentia is sufficient to obtain the effects analagous to those of castration; experiments on the dog have confirmed this view. The results, however, have been more slowly attained. The question, arises, how does this operation effect its result? It is known that the testicle still secretes spermatozoa, and this fact alone proves that the functional activity of the gland has not been suppressed. The author attempts to outline a table of indications for these new precedures; he believes the operation to be of value inversely to the age of the patient, especially in those cases where congestive phenomena are present; for he believes that in the majority of cases the happy results of this operation are due to its anti-congestive effect. Advanced cases he believes are absolutely unfitted for this method of interference. Simple, difficult, or impossible catheterization requires cystotomy. This measure meets, in the author's estimation, surely and rapidly the three principal indications, viz., restoring the power of micturition, placing the bladder at rest, and draining the urinary apparatus. In those cases which require immediate intervention, catheterization being impossible, hypogastric punctures should be practiced two, three, or four times if necessary; oftener than that it is unwise to repeat it. If retention persists and the use of the catheter is still difficult you can then resort to castration or resection of the vas deferens.

FRAZIER.

Preventive and Temporary Tamponing in Operations of the Hollow Viscera of the Abdomen. (*Centralbl. f. Chir.*, June 19, 1897.) By Carl Lauenstein, M.D.

For a number of years past the author has proved this "temporary tampon" to be of valuable assistance in operations on the hollow viscera, such as the stomach, intestines, bladder, and gall bladder. He finds it especially of assistance in preventing the escape of the contents of the viscera during operation. He has applied it in operations performed in an attempt

to close fistulæ on the various organs mentioned. The technique is so simple that the author doubts not but that other surgeons have demonstrated for themselves its usefulness. He cites for an example of the employment of this temporary tampon an operation to close a fistula of the stomach, resulting from a previously existing perforation of a gastric ulcer, through the anterior wall of the abdomen. He evacuates the contents of the stomach by irrigation and then packs a very long strip of gauze through the fistula into the stomach, allowing the tail end of the gauze to project from the fistula; this prevents any escape of contents into the abdominal cavity. He recommends that the suturing of the stomach be commenced with the gauze still *in situ*, the tampon being gradually withdrawn, as each additional suture slowly diminishes the size of the wound; before the last suture is inserted, what remains of the tampon is withdrawn. In a like measure Lauenstein recommends the use of this tampon in the removal of artificial ani, resulting from a ruptured hernial sac; especially has he found it of service in operative procedures on the gall bladder, not only in closing fistulæ but in removing gall-stones. The above described temporary tamponing of the hollow viscera is also of service in the operative treatment of primary injuries, not only in wounds of the intestine, but also of the bladder. He adds that the late Hans Schmid recommended this tampon for operations for the removal of the sac of a hydronephrosis.

FRAZIER.

Castration and Vasectomy in Hypertrophy of the Prostate. (*University Med. Mag.*, April, 1897.) By J. William White, M.D.

In a clinical lecture delivered in the University Hospital, White states that with him this subject first took definite form in the fall of 1892, when a series of experiments on dogs were conducted under his direction to determine whether castration would be followed by notable atrophy of the prostate. The idea was suggested to the author by the comparison made, first by Velpeau and afterwards by Sir Henry Thompson, between prostatic and uterine fibro-myomata. The results of the experiments showed rapid atrophy of both glandular and muscular elements. The author claims priority in recommending castration as an appropriate treatment for hypertrophied prostate. In persons who have sufficient enlargement to demand some form of treatment, he describes four chief symptoms and four associated conditions as existing: 1. Condition of prostate as to size and density; 2. Amount of pain; 3. Amount of residual urine; 4. Frequency of catheterism and its ease or difficulty. As secondary conditions: 1. Age; 2. Sexual power; 3. Condition of kidneys; 4. General condition. In accordance with these symptoms he divides prostatics into four groups. (a) Includes patients with moderate hypertrophy, little or no pain, clear residual urine, to the extent of three or four ounces, and who have not begun catheterization. If in addition the patient is not old, re-

tains his sexual power and has sound kidneys, castration is not to be considered. The proper treatment in this class is the proper use of the catheter once in 24 hours. There are certain modifications of this class which require other methods of treatment, such as excessive and uncontrollable pain, constantly increasing amount of residual urine, difficult or painful catheterization; these cases are those for which White recommends the operation of vasectomy. (b) Includes patients with larger prostates, the size of a lemon being taken as a minimum, with eight to ten ounces of residual urine, now infected, with frequent urination and difficult or impossible catheterization. For these cases operative interference is positively indicated and we must choose between vasectomy, castration, and prostatectomy. The age, sexual power, and condition of the kidneys are factors that must influence one in selecting the operation. The younger the patient, the greater the sexual power, the freer the kidneys from disease, and the better the general health, the more the surgeon should incline to prostatectomy. In cases with enfeebled sexual power, more advanced age, and marked renal disease, vasectomy is the operation of choice. Those cases with still more advanced age and distinctly lessened sexual power, the conditions of the general health, as well as kidneys, being good, castration promises the best results. Extreme density and hardness of the prostate should weigh in favor of prostatectomy. (c) Includes more serious cases with a very much enlarged prostate, nearly complete or complete retention of urine, cystitis, and difficult or painful catheterization. In these cases castration is the operation to choose, although the author states vasectomy may first be tried with propriety. (d) Includes the desperate cases when all the symptoms are exaggerated; cystitis excessive, retention absolute, catheterism difficult, toxemia, inefficient kidneys, and general atheroma. Though any operation is dangerous to this class of cases, White believes castration offers the greatest hope of material benefit, with less risk than any other operation. Certain complications affect the choice of operation; 1. Vesical calculus is not looked upon by the author as a contra-indication; on the other hand he recommends and has performed castration as a preliminary procedure to litholapaxy. 2. Suppuration of the testicles or prostate, though influencing the prognosis, is otherwise regarded as an additional indication for castration. 3. Strictures not easily dilatable call for a perineal urethrotomy combined with prostatectomy, performed through the same wound. As regards the effect of the operation on the mental condition the author believes, that while a form of delirum has been noted as an immediate sequel and is, it may be added, an unfavorable symptom, he has never seen a case that survived, in which any permanent change was noticeable. The prognosis as to the prospects of cure based on clinical experience, is good. In 87.2% rapid atrophy of the gland followed. The mortality he places at 18% for castration and 12% for vasectomy; excluding cases belonging to group (d), the mortality is reduced to 6 or 7%.

As to the theory of the operation, the following is suggested; "the function of the testes is twofold, reproduction of the species, the development and preservation of secondary sexual characteristics of the individual. The need for exercise of the latter function ceases when full adult life is reached, but it is possible that the activity of the testes and ovary in this respect does not disappear and that hypertrophies in closely allied organs like the prostate and uterus, are the results of this misdirected energy." In closing he urges the importance of careful study of each prostatic case before concluding as to the treatment to be recommended.

FRAZIER.

Operative Treatment of Prostatic Hypertrophy. (*Wiener med. Wochenschrift*, Nos. 9, 10, 11, and 12, 1897.) By Dr. Allino.

The author briefly reviews the history of the treatment of a hypertrophied prostate and adds that in the last two years the treatment of this affection has been revolutionized. He refers to the writings of Desnos, in 1893, which record puncture of the bladder as being the only then known method of treatment, as a substitute for continuous catheterization. Heine, Casper, and Roux proposed parenchymatous injections with iodine and other drugs, but with such sad results that catheterization and irrigation were again helplessly fallen back upon, and if this method was difficult or impossible, a vesicle fistula was established. Sometime afterwards, considering the effect of ligation of the uterine artery upon uterine myomata, Bier practiced ligation of the internal iliac artery with the hopes of diminishing the size of the prostate, but with no positive results. The author then refers to the observations of Lannois, Godard, Griffiths, and Fenwick, who pointed out the intimate relation of the prostate to the testes and the effect of disease or absence of the latter on the prostate gland. P. Bruns, in his work, "Ueber den gegenwärtigen Stand der Radikalbehandlung der prostata hypertrophie insbesondere mittelst Kastration," collected 148 cases which had been operated upon at that time. Of these, diminution of the prostate sooner or later, and to a greater or less degree, followed in 93 per cent. Subsequently, removal of only one testis, ligation of the vas deferens, and the internal administration of extract of prostate, were introduced as therapeutic measures. The writer then describes in detail eight cases operated upon by v. Dittel. The first patient, 54 years of age, with a prostate about the size of a lemon and fairly hard, with absolute retention, was operated upon August 9th, 1895. The vasa deferentia were resected under cocaine anesthesia. The result was at first brilliant; the retention and residual urine disappearing altogether; the gland was somewhat softer and slightly diminished in volume. Two months after the operation, however, the patient reported that he was compelled to urinate hourly, that the urine had become cloudy and was passed only drop by drop, and that the nocturnal seminal emissions were less frequent, all

sexual impulses having vanished. The second case, in which the same operation was practiced, furnished a better result. Six months after the operation the residual urine had diminished from 1,000 to 100 c. c. and the prostate gland reduced to one-half its original size. In case three, the immediate results were brilliant; but before a month had elapsed the previously existing state of the patient had returned, his mind became unbalanced and death ensued. The operation in the fourth case consisted in ligation of the vas deferens on the left and the artery alone on the right side. From 1,400 c. c. of residual urine, the quantity decreased to 300 c. c., and from voiding voluntarily only 50 c. c. of urine the patient was able to void 1,800 c. c. without difficulty. The left side of the prostate seemed to be diminished in size to a greater extent than the right. This improvement was only temporary and after his condition had returned to its preoperative state, the patient died of broncho-pneumonia. Absolutely no improvement was observed after operation in the fifth case. Three phosphatic calculi were discovered in the bladder and crushed; subsequently, the vesicle catarrh was mitigated and the power of micturition very much restored. The next case showed no alteration in size of prostate, although in this, as well as the last three cases of the series, the difficulties of micturition were at first greatly diminished. *Observations:* 1. Diminution in the volume of the prostate follows less rapidly after ligation of the vasa deferentia than after castration. 2. The effect on the prostate is due primarily to disturbance of the nerve supply. 3. Changes in the prostate consist chiefly in disappearance of the glandular and its substitution with connective tissue. 4. While changes in the prostate take place comparatively quickly those in the testis develop much more slowly, and not in proportion to the changes noted in the prostate. 5. The improvement of the vesical complications, while true, is the most difficult feature to explain. Absolute retention of urine and chronic vesical catarrh have in some cases entirely disappeared. It is noted that in those cases where alterations in the gland structure and amelioration of the symptoms appear almost immediately after the operation there is a greater tendency to relapse than where the development has been gradual.

FRAZIER.

Treatment of Unilateral Congenital Luxation of the Hip by the Creation of Femoro-Iliac Ankylosis in Good Position. (*Lyon Médicale*, February 21, 1897.) By M. V. Rochet.

The operation of Hoffa has attracted, particularly in this epoch, the attention of surgeons, and consists essentially in the reduction of the head of the femur into the acetabular cavity, which has been reconstructed. On referring to the discussion of the Société de Chirurgie at Paris and other Congresses, it will be seen that an opinion as to the true value of this operation has not been definitely formulated. The difficulty in reduction

and the sometimes complete absence of the cavity seriously embarrass the surgeon. The operation described in this paper—namely, the formation of an ilio-femoral ankylosis in good position—surmounts the difficulties met with in the procedure of Hoffa. Unfortunately, the method is applicable only to cases of unilateral luxation. The steps of the operation are as follows: 1. Exposure of head of femur by Langenbeck's or d' Ollier's incision for formal resection. 2. Incising capsule through its entire length. 3. Destruction of the serous lining of capsule with the curette. 4. Drawing head of femur down by vigorous traction. 5. Suturing superior portion of capsule. 6. Retrenchment of all the loose and redundant portions of capsule. 7. Closure of wound, the various planes of muscles being sutured separately. 8. Application over the usual antiseptic dressings of a plaster-of-Paris bandage, including buttock and pelvis, energetic traction being employed during its application. Extension on leg and foot. Four cases were operated upon by this method. In the first case, at the end of five months, a very firm ankylosis was established. Two of the cases have been examined—two years and two and one-half years, respectively—after the operation, but show no recurrences. In conclusion, it may be said that in unilateral cases of congenital luxation (and they are almost as frequent as the bilateral) we have recourse to a relatively simple operation, which has over Hoffa's and its modifications certain advantages: 1. Every step of the operation is practicable. 2. It is not serious and involves the least damage to the tissues in attaining a good result. One could apply this treatment also to cases of acquired luxation.

FRAZIER.

The Pathology and Treatment of Congenital Dislocation of the Hip. (*Arch. di ortop.* Vol. XIV., p. 1, 1897.) By A. Lorenz.

The author first discusses in this monograph the pathological anatomy of the malposition. He notes the great obstacle to the reduction of the femur as being the shortening of the muscles passing from the pelvis to the lower limb,—namely, the sartorius, tensor vaginæ femoris, rectus, gracilis, semi-tendinosus, membranosus, and biceps. Upon this observation his method of operation is founded, differing from Hoffa's in the particular muscles subjected to division. The etiology is obscure, but the view of Grawitz, that the smallness of the acetabulum is due to ill development of the Y-shaped cartilages while the head of the femur undergoes proper development, is the one that the author favors. Lorenz regards Hoffa's operation as a distinct advance in the treatment of the deformity, in that the head of the femur is thereby replaced in the acetabular cavity, which has been previously deepened. He differs in one respect from Hoffa, who believes that all the muscles passing from the pelvis to the thigh are shortened and must therefore be divided. The author does not think it necessary to divide the muscles attached to the trochanter, inas-

much as he does not believe them to be shortened, and consequently in his modification of Hoffa's operation this part of the procedure is omitted.

FRAZIER.

True Elongation of the Spinal Cord and its Application to the Treatment of Locomotor Ataxia, Experimental and Therapeutic Researches. (*Gazette des Hôpitaux*, April 29, May 4 and 6, 1897.) By Gilles de la Tourette and A. Chipault.

In the course of researches on the topographic anatomy of the vertebral column and of the spinal cord, attention has been drawn to the fact that, by the aid of certain well defined maneuvres, the spinal cord may be appreciably elongated. An endeavor has been made to turn this fact to therapeutic account. If a cadaver, which has not previously been subjected to a post-mortem examination, is suspended by a Sayer's apparatus which has been deprived of its axillary supports, it will be seen that the vertebral column becomes elongated about one centimetre. The spinal cord and the roots of the spinal nerves, on the other hand, do not become elongated to an appreciable extent. In order to appreciate this fact, the spinal canal should be previously opened throughout its entire length. On the contrary, flexion of the vertebral column produces a true lengthening of the spinal cord and of the nerve roots. This increase in length is about one centimetre in extent, and the consequent stretching affects principally the posterior aspect of the cord in the neighborhood of the first pair of lumbar nerves. The authors have devised a portable table which is supplied with a small back-board, to which a strap or girth is attached. In the middle of the table, at the junction of the posterior third with the anterior two-thirds, a pulley is fixed, under which a traction-cord passes to a tackle-block fastened at the foot of the table. The patient sits square upon the table with his legs extended, one on either side of the pulley. The trunk is then fixed by the strap which is attached to the back-board, in order to provide resistance to the forward movement of the body. The legs are kept straight, the heels resting on the table and the inner margins of the feet touching each other, by a strap which is passed around the table and fastened below the knees. The essential part of the apparatus consists of a belt, which has four branches arranged in the form of a letter X. The two upper arms are furnished with rings, which are placed a little distance apart. Of the lower arms, the smaller, which should be on the left side of the subject, is provided with a buckle; the larger passes around the pelvis of the subject, then under the table, and is fixed to the buckle of the smaller branch. The two upper branches pass under the arms of the patient, and in the back they are crossed so that the right strap passes to the left and *vice versa*, the free ends then being carried over the shoulders, where they rest like suspenders. A semicircular bar of iron, which terminates in a hook at each end, is attached to the rings on these two upper

arms of the strap. To the centre of this iron semicircle is a ring to which the traction-cord is fastened. The traction-cord, then passing through the pulley and down between the legs of the patient, is so disposed that horizontal traction becomes vertical. If the apparatus is adjusted to a patient and the traction-cord is manipulated, the subject must flex the vertebral column. The flexion is applicable to all cases except those in which the intervertebral discs are very elastic, as in certain acrobats, and in those subjects in whom the fat in the abdominal wall is so great that it opposes flexion. In the majority of cases the force to employ, measured by a dynamometer placed between the notch of the tackle-block and the traction-cord, varies from sixty to eighty kilogrammes. This maximum is gradually attained through from five to six sittings. If the force is applied too quickly, the patient will experience sharp pains in the dorso-lumbar region. If the traction is exaggerated, the subject will experience a sensation of tension in both sciatic nerves. This feeling is the best proof that the spinal cord and the large nerve trunks have been stretched. If the force is too great, there is danger of producing double sciatica. After the treatment the patient ought to rest for several minutes. The traction ought to continue for from eight to twelve minutes. The treatment has been used for forty-seven ataxics ; twenty-two have been markedly relieved, fifteen partially relieved, and ten have derived no benefit from it. The operation is contra-indicated in advanced cases of tabes, in the third period of the disease, and in tabes of acute course.

SWAN.

Hemorrhagic Periorchitis. (*Beiträge zur klin. Chirurgie*, Vol. XVIII., No. 1.) By W. Zangenmeister.

This writer reports two cases of hemorrhagic periorchitis from Professor Czerny's clinic. The affection is rather rare, Packer in 1897 being unable to gather more than 86 cases from literature. The characteristic feature of this disease is a hyperplasia of the connective tissue in the tunica vaginalis propria. According to Virchow the disease is that due primarily to hemorrhage into the tunica, but consists of a peculiar hemorrhagic inflammation with secondary bleeding either per diapedesin or per rhexin. Traumata are perhaps the most frequent causative factors, especially puncture and evacuation of hydroceles, with the accompanying rapid reduction of pressure. Disturbances of circulation and their resulting hyperemia due to any cause, added to pre-existing disease of the testicles, epididymis, vas deferens, hernia, atheroma of the arteries, and hemorrhagic diathesis are predisposing causes. The cyst wall is often as thick as a finger, distinctly laminated and frequently contains plates or a complete shell of calcareous or bony deposit. Macroscopically small hemorrhagic foci can generally be made out. In more recent cases the cyst wall is lined with a fine reticular membrane, which can be detached. The contents consist of serous, sero-fibrin-

ous, or hemorrhagic fluid, in older cases of a more syrupy consistency. Microscopically the wall consists of an inner and an outer layer, between which numerous hemorrhagic foci, either as masses of red blood corpuscles or as diffuse infiltration of the young connective tissue layer of the second coat, are found, and which thereby assume the appearance of becoming detached and merged into the first layer. This layer, must, therefore, be regarded as the seat of the disease. In older cases, the lining membrane is devoid of endothelium, and in all cases the cyst wall becomes more and more dense towards the periphery. The author explains the formation of the young connective tissue by the compression of the lymph channels by the hemorrhagic infiltration and consequent hypernutrition of the surrounding tissue (similar to elephantiasis). The treatment of more recent cases consists in partial resection of the tunica; that of older cases, with calcareous and bony deposits, in castration. The author recommends that after puncture and evacuation of hydroceles the patient should remain quietly in bed during several days.

MUEHLECK.

Lupus of the Extremities. (*Beiträge zur klin. Chirurgie*, Vol. XVIII., No. 1, 1897.) By H. Küttner.

This author reports eleven cases of this rare affection from P. Bruns's clinic. He divides them into two groups: (1) that in which the process has the tendency to penetrate and destroy the deep underlying structures; these he calls lupous mutilations; and (2) that group in which the disease shows no tendency to attack the deeper structures, but causes extensive destruction of the skin and consequent severe cicatricial contractions, inhibition of growth, osteoporosis, and deformity. Discussing the four cases of the first group observed in Bruns's clinic, the author calls attention to the great similarity microscopically between this form of lupus and epithelioma of those parts, such as papillomatous layer, proliferation of the cells of the rete forming masses of epithelial cells which dip down frequently and become detached and distorted by compression. Frequently the characteristic cell-nests (Epithel-perlen) are met with under which is found connective tissue more or less rich in cells, and finally numerous lupous foci. The destructiveness is, however, not due to this epithelial cell proliferation, as in epithelioma, but to the ulceration of these foci. The seat of predilection seems to be the lower extremity (3 : 1 Kuttner, 4 : 1 Bush). The fingers and toes are attacked in three ways : (1) the process begins on the last phalanx and destroys the phalanges in succession ; (2) the phalanges are attacked irregularly and destroyed ; and (3) a circular constriction is formed which, becoming deeper, gradually severs the fingers. All the cases of this growth present very marked elephantiac thickening of the affected parts, run an extremely chronic course and not rarely show syndactylic deformities. The differential diagnosis between this condition and

syphilitic dactylitis and frambosia or yaws, with which latter condition, according to Bush, it has most similarity, is important. The treatment consists in amputation of the affected parts. The second group, or that with lupous deformities, is very rare. Here also syndactylic union is observed, but the characteristics of this group are extensive ulceration of the skin with cicatricial contractions, grave changes in the neighboring joints and bones, such as contractions, luxations, and subluxations, changes in the articular surfaces, various disturbances of growth, and osteoporosis. Hyperextension in the metacarpo-phalangeal joints and flexion of the fingers is most frequently met with. Intermediate forms between these two groups were not observed at Bruns's clinic. Cases of this group might be confounded with lepra, owing to their great similarity, but the differential diagnosis should not be difficult. The prognosis is better than in the first group, since energetic local treatment is usually efficacious if resorted to in time.

MUEHLECK.

On Congenital Exstrophy of the Bladder. (*Beiträge zur klin. Chirurgie*, Vol. XVIII., No. 1, 1897.) By A. Tietze.

In an admirable article on this subject the writer critically reviews the different methods of operative treatment of this condition and reports seven cases from Mikulicz's clinic. He divides these methods into three groups: (1) covering of the defect by means of single or double skin-flaps from the neighborhood of the bladder. The disadvantages of this method are the absence of a sphincter in the newly created bladder surface, and consequent incontinence and the formation of incrustations caused by the growth of hair in the direction of the lumen of the bladder. (2) Extirpation of the mucous membrane of the bladder and implantation of the ureters into the urethral fossa or into the rectum (the former by Lauenburg and the latter by Meydl), thus obviating the troublesome inflammations of the mucous membrane after operations for this condition. The objections to this method are the constant dribbling of the urine and the exposed position of the ureters. Meydl was successful in two cases, but the danger of infection of the renal pelvis seems to be a very grave objection to this method. (3) Trendelenburg's method of freeing the bladder wall, inversion of the edges, and suture. The operation is performed in two sittings. In the first one or both symphyses sacro-iliacæ are severed, and by means of proper orthopedic apparatus the pelvic ring is made smaller. In the second sitting the bladder is sutured. Of the six cases operated on by Trendelenburg one had continence. Objections to this method are the extensive and dangerous separation of the bones of the pelvis, contraction of the pelvic ring, and inward rotation of the legs. Neudorfer, Czerny, and others freed the bladder wall and united it with sutures and covered the abdominal defect by one or more plastic operations. In 1891 Schlange

recommended two vertical incisions on each side of the bladder down to the transverse fascia, the musculi recti are then freed from the latter and their insertions together with a piece of the symphyses are chiselled off, when the bladder wall is easily freed and sutured. The penis having previously been formed by Fierson's method. After two years a fistula still remained. There was no continence, but the bladder was large enough to serve as a receptacle for the urine for several hours. Of the seven cases of Mikulicz two were successful, but with incontinence, three only partially so, and two were failures. Adding to these the cases reported by Czerny and Schlange we have a larger number of cases successfully operated on by this method than by that of Trendelenburg. Nevertheless it would appear to the author that the method of suturing as recommended by Trendelenburg is safer, since it insures a more complete narrowing of the neck of the bladder. According to the author the operation should be done in three sittings with intervals of weeks, as follows: (1) closure of the bladder, (2) closure of the penis, (3) closure of the neck of the bladder. In conclusion Tietz observes that we are still very far from an ideal method of treatment for this condition, but that the operation of Schlange, with Trendelenburg's suture of the neck of the bladder is to be preferred.

MUEHLECK.

NEUROLOGY.

A Contribution to the Pathology of the Nerve Cell. (*Fortschritte der Medicin*, No. 7, 1897.) By Goldscheider and Flatau.

These experimenters injected malononitrile (methylene cyanide, CN—CH_2—CN) into rabbits, and produced violent symptoms of poisoning. By the injection of sodium hyposulphite ($Na_2S_2O_3$) the animals were rescued even in advanced stages of poisoning, and within a few minutes after the injection were able to run about. Goldscheider and Flatau studied the condition of the nerve cells under the influence of the poison and under that of the antidote. After the injection of malononitrile alone, they found in the nerve cells of the anterior horns of the cord more distinct staining of the ground substance of the cells; granular disintegration and displacement of the Nissl corpuscles; more intense coloration of the nuclei; and displacement or absence of the nucleoli. The condition of the cells after the injection of the sodium salt was dependent on the period which had elapsed since the injection, and after seventy-one hours the nerve cells showed no notable alteration. After exposure of other animals to temperatures above 43°C., marked alteration of the nerve cells was found. These changes were not seen in nerve cells which had been exposed to high temperatures after the animal had been killed, and it was evident, therefore, that they were vital processes. When the animals were allowed to recover from the effects of the exposure to high temperatures the nerve cells were found to

be in different stages of restoration, according to the time which had elapsed since the exposure. After sixty-eight hours the cells appeared to be normal. The writers state that the recuperative powers of the nerve cells after marked alteration are surprising, and it would seem that the condition of the Nissl corpuscles has little significance. Even the importance of these elements for the function of the cell is questionable, for the cellular changes in all cases did not correspond with the functional. The poisoned animals recovered within a few minutes after the injection of the antidote, while the cellular changes disappeared only gradually; function, therefore, was discharged while the cells were greatly altered. The same was true of the animals exposed to high temperatures. The authors warn against the tendency to ascribe too closely the clinical symptoms to these cellular alterations.

SPILLER.

A Case of Partial Rupture of the Spinal Cord without Fracture of the Spine. (*British Medical Journal*, March 13, 1897.) By A. M. Watts, M.R.C.S.

A man fell out of a wagon but picked himself up and walked a mile. Three hours after the accident he noticed that he had no power in his right hand, then that his left hand was paralyzed, and then that he could not move his legs; the paralysis came on so rapidly that it seemed to affect all his limbs almost simultaneously. When the patient was examined two days afterwards, the respiration was found to be diaphragmatic, there were no cerebral symptoms, and no irregularity of the spinous processes. Movement of the neck caused pain. The man had some power of motion of the arms, but none of the hands. The knee-jerks and plantar reflexes were absent, and all sensation was lost in the trunk and lower limbs below the level of the third costal cartilage. Sensation was much affected in the upper limbs. Constipation and retention of urine were noted. Death occurred twelve days after the accident, from edema of the lungs. From the absence of any signs of fracture of the spine, and also from the absence of pain in the course of the nerves and of hyperesthesia, the injury was thought to be probably limited to the spinal cord. At the autopsy no signs of vertebral fracture and no hemorrhage within the canal were found. The dura was torn transversely across in its left half, and the left half of the cord was torn across in the line of the wound in the dura. The rupture of the cord was opposite the articulation between the sixth and seventh cervical vertebræ. The interesting features in this case, according to the writer, are (1) the rupture of the cord without vertebral fracture; (2) the ability of the patient to walk a mile after the accident, and the development of the paralysis three hours after the fall; (3) the bilateral paralysis; (4) the absolute loss of reflexes, though the cord was not entirely divided. [The case is extraordinary, but it is probable that micro-

scopic sections, if they had been made, would have shown intense alteration of the right half of the cord, and this would have explained the bilateral paralysis and loss of reflexes.]

SPILLER.

The Structure of the Nervous Protoplasm. (*Monatsschrift f. Psychiatrie und Neurologie*, Vol. I., Nos. 2 and 3.) By S. Ramon y Cajal.

It is difficult to abstract this valuable paper, for it is necessary to read it in detail to understand it fully. The writer believes that the chromophilic elements of the nerve cell consist of a special kind of chromatin. A beautiful picture of a motor cell is given, differing somewhat from those described by most writers. The spindles are of irregular outline and are provided with spines; they contain vacuoles and present much the appearance of a sponge. The unstained portion of the cell (spongioplasm) consists of a network connecting the spindles, and possessing chromophilic granules at the nodes. This reticulum is continuous with the fibrillary tissue of the axis-cylinder. Cajal will not express himself in positive terms concerning the presence of the reticulum in the spongioplasm during the life of the animal, but he seems inclined to believe that it is not a coagulation product. He also believes that chromophilic elements are probably a reserve substance for the nutrition of the cell, and that, although the fluid within the meshes of the spongioplasm may be of importance in the conduction of nerve force, it is more probable that the trabeculæ in the unstained portion of the cell body are more concerned in this function. He shares Nissl's view, viz., that the chromophilic state (retraction of the cell body, approximation of the stained elements, intensity of coloration of the cell) probably represents exhaustion of the cell. He states that chromatin is present in certain leucocytes, connective tissue, and neurogliar cells, but occurs in considerable masses only in the large ganglion cells; and that the more perfect the form of the nerve cell, the more numerous and distinct are the chromophilic elements. The concentration of the chromatin of the nucleus in the nucleolus in the more highly developed cells is probably indicative of the loss of proliferative power.

SPILLER.

A Case of Abscess of the Right Temporo-Sphenoidal Lobe. (*British Medical Journal*, May 22, 1897.) By Hamilton A. Ballance, M.S., F.R.C.S.

The diagnosis of cerebal abscess was made in a case in which there were stupor, left hemiparesis, left hemianesthesia, right-sided otorrhea, low temperature, slow pulse, slow respiration, etc. The paralysis on the opposite side to the otorrhea made an involvement of the right lobe of the cerebellum improbable, for it has been shown that in disease of the cerebellum paralysis,

if it occurs, is on the side of the lesion. Loss of sensation is not a symptom of cerebellar abscess, though Russell mentions some blunting of sensibility in the paretic limbs in his ablation experiments on the cerebellum. The right pupil was in a state of stable mydriasis. This has often been recorded in large temporo-sphenoidal abscesses, and is apparently a pressure phenomenon of the third nerve. It does not occur in cerebellar lesions, and lateral deviation of the eyes, which is common in these, was not present in this case. An abscess in the temporal lobe may cause paralysis, either by means of a complicating meningitis, in which case convulsions are not unusual, or by pressure, when marked loss of sensibility usually precedes the paralysis, and convulsions do not occur. The writer states that Macewen has said that no case of abscess has yet been recorded which certainly showed that the paralysis was due to involvement of the internal capsule, and he considers the paralysis in his case as due to this cause. There were no convulsions, and the loss of cutaneous sensibility was very marked. The leg was more paralyzed than the arm, and the face least of all, which is the condition to be expected in capsular paralysis from abscess. The hemiparesis also rapidly disappeared after evacuation of the abscess. The patient showed great improvement after the operation, but had a relapse, and died nine days after entering the convalescent home. At the autopsy, thick yellow lymph was found at the base of the brain, and the abscess cavity in the posterior part of the temporal lobe was seen to be very near the internal capsule. [Dr. Mills and the abstracter have given a picture of a microscopic section through a temporal lobe containing an abscess cavity close to the internal capsule, and have shown that the paralysis in their case must have been due to pressure on the internal capsule.]

SPILLER.

An Unusual Case of Hemiplegia. (*Journal of Nervous and Mental Disease*, July, 1897.) By William G. Spiller, M.D.

The case is that of a Dane who, at the age of thirty-three, was a chief proof-reader on a daily paper and spoke fluently seven languages. While bathing in the ocean at Atlantic City, in 1891, he noticed two men beyond their depth in danger of drowning. He went to their rescue, supporting one with his left arm while another clung about his neck. He was in this position twenty minutes before the life boat came, and the two men were brought ashore. The patient himself was seized by the undertow and, much exhausted, finally reached land. The same afternoon he took a train for Philadelphia, wrote a letter, and worked all night reading proof. He went home at six A. M., undressed, but before getting into bed lost consciousness and fell to the floor, remaining, probably, a few minutes, as he states that he noticed by the clock that only five minutes had passed. He was unable to rise, though he could raise both arms and move his head

from side to side. Power became gradually less in the upper limbs under his observation, and was finally lost. He made some exclamation after he was unable to move any of his limbs, relapsed into unconsciousness for two or three hours, was completely aphonic, though he understood conversation heard at his door, and for the next two days was more or less unconscious. He then found he could use his left limbs, but could not move his right arm or leg or fingers of the right hand. Right hemianesthesia of the body of a considerable degree, and sharply limited by the median line, was observed. After he had awakened from unconsciousness, and on the fourth day of his attack, he replied in Danish to questions in English. After three months he was able to speak some English, and three years later, during a visit to Sweden, he regained the power of speaking the language of that country within a day and a-half. The patient now presents the appearance of a vigorous, intelligent man. He makes no use of his right arm. He has no power of extension, abduction, or adduction in the fingers of the right hand, and only slight power of flexion. On raising the right arm, which he can only do to a very limited degree, a violent intention tremor is developed in the arm, forearm, and hand. Forcible extension of the hand at the wrist also causes this tremor, but an attempt to passively flex the forearm on the arm tends to partially check it. The tremor at the wrist partakes at times of the movements of flexion and extension; at other times it is more rotatory in character. There is no tremor when the limb is at rest. The patient has had this tremor in the arm for two or three years; he had a similar tremor in the right leg (though this was observed also during rest) which developed soon after the paralysis and ceased gradually three years ago, though it returns even now when he is excited. This involuntary movement has not been observed in any other part of the body. Sensation for heat, cold, pain, and touch is now about the same on the two sides of the body. In walking he swings the right leg. There is no muscular atrophy in any part of his body. The knee-jerk and muscle-jerk in the right lower limb are exaggerated, and ankle clonus is present on the right side only. The reflexes at the wrist, olecranon, and biceps tendon are exaggerated on the right side. The reflexes on the left side of the body are about normal. The chin-jerk is prompt. There are no hysterogenic zones. The nasolabial fold on the right side is a little less prominent than on the left. The tongue is protruded in the median line. There is no limitation of the fields of vision, as tested with the fingers. Taste, smell, and hearing are normal. There is no history of venereal disease to be obtained, though his wife has had two or three miscarriages. The patient has three living and healthy children. The writer, as may be gathered from his paper and his remarks following the discussion of the case, does not deny the possibility of an organic lesion in this patient, and acknowledges that,without any history of the development of the hemiplegia and of the man's condition until the present time, a diagnosis of organic

disease would seem to be the correct one. He believes, however, that any diagnosis which is based on certain facts in a case, to the exclusion of others of importance, must be a faulty one. He thinks there is nothing in the man's present condition which could not be the manifestation of hysteria, as hysteria may so closely simulate organic disease and may last for years; that the tremor in the right lower limb, which at one time was violent but appears now only when the patient is excited, and that the peculiar tremor in the right upper limb, which did not develop until three or four years after the onset of the hemiplegia, are suggestive of hysteria. If the history of the development of the affection (especially the complete paralysis of all four limbs, the gradual loss of power in both upper limbs under the observation of the patient, the ability to speak after the paralysis of the body was complete, later the aphonia with perfect understanding of conversation heard before his door), is considered in connection with the man's present condition, the writer believes that the hemiplegia must be regarded as probably hysterical, and that while an organic lesion may possibly be present, we are not justified in diagnosticating it.

HINSDALE.

A Case of Hysteria Simulating Organic Disease of the Brain. (*The Medical Fortnightly*, July 1, 1897.) By S. D. Hopkins, M.D.

A stonecutter, aged 67, had good health with the exception of aural and bronchial catarrh until 1865, when he ruptured the long head of the biceps tendon and received an injury to the head and chest from which he was unconscious half an hour. After this he spat blood, and complained of pain in the chest, a roaring noise in the head, and headache. Denies syphilis and alcoholism. Present illness began in 1866. While driving a pair of colts, they became frightened, and in trying to check them, he noticed that the left leg and arm were weaker that the right, the leg being more affected than the arm. The weakness gradually increased, and in a few months it was marked, and at the same time wasting was noticeable. His symptoms remained about the same until 1880, when he fell in the street. Before the fall he experienced numb and tingling sensations in the left side of the body, headache, and dizziness. Immediately after falling he lost consciousness for one-half hour; after regaining consciousness he suffered from the same symptoms as he did previous to the attack. None of the symptoms were exaggerated after this spell. In the succeeding two years he had four attacks, similar in all respects to the first one. After each he suffered from dizziness and headache. He was free from the attacks from 1882 until two years ago, 1895 (during this interval the paralytic symptoms remained stationary), when they recurred, but increased in frequency, having an unconscious spell every third month. During the last year he has suffered with headaches, loss of memory, and irritable temper. Dynamometer, right 72, left 28; both knee-jerks increased.

Tactile sense is lost throughout the entire left side of the body, excepting an area about four inches long and two inches wide; midway between the knee and ankle, a spot about the size of a silver dollar on the outer side of the leg, below the knee, the entire left ear, and left side of penis. Pain sense is lost throughout the left side of the body, excepting where tactile sensibility is present, but is lessened in these spots. Temperature and localization senses lost. Postural and joint senses present. Pressure sense is only recognized when a very heavy weight is used, and then only as a slight touch. Muscular power of left side lessened; right side, good. All sensory phenomena, normal throughout the right side. Hearing, smell, and taste absent on the left side. Pupils normal, fields contracted slightly. Urine normal. Partial aphonia present. Dr. Hopkins excludes epilepsy and considers the case hysterical of hemiplegic type. The treatment consisted of ten grains of potassium iodide three times a day, and the use of hypnotic suggestion. During the first hypnotic treatment, the anesthesia was transferred to the opposite side of the body, and the suggestion was made that sensation would first return in the face, and later in other portions of the effected side; also that motor power would return. When he awoke he had visual hallucinations, and made violent movements with both sides of the body. On being reprimanded for his actions, he immediately became quiescent, and one hour later demonstrated how he could use his paralyzed hand, making the statement that the power in the left hand was greater than it had been for years. Sensory phenomena were perfect in the face.

HINSDALE.

Hysterical or Functional Blindness. (*New York Medical Journal*, July 17, 1897.) By Alvin A. Hubbell, M.D.

The author relates three cases in which complete loss of vision in one or both eyes occurred without the presence of fundus changes or lesions of the optic nerve or brain, as far as could be detected, to account for it. Restoration of function occurred in all the cases. The first was that of a young lady aged eighteen. On March 9, 1897, she was seized with pain in the left eye, which extended over the left side of the head and into the left ear. This was so severe as to require anodynes for its relief. In three days it had nearly disappeared. The vision of this eye began to be affected soon after the onset of the pain, and was very "foggy" the next day, March 10th. On the morning of the third day, March 11th, when she awoke, she found that the vision of this eye was lost, not being able to distinguish even light with certainty. Examination of the eyes externally showed them to be alike in appearance and their movements normal. The pupils were of normal and equal size, but the reaction to light was a little slower and less complete in the left eye than in the right, there being a slight dilation when exposed alone. There was manifest hypermetropia of

0.50 D. of the right eye and vision was $\frac{5}{4}$ Snellen's test-types. The vision of the left eye seemed entirely lost. There was perhaps a slight perception of strong light at the extreme temporal part of the visual field, but of this the patient was not quite certain. Ophthalmoscopic examination through the undilated pupils did not show anything abnormal in either eye. To insure a more thorough inspection of the left eye the pupil was dilated with homatropin solution. A most careful search was then made for some pathological change in the fundus, but not the slightest could be found. There was no obstruction in the retinal circulation or change in the vessels, no edema, discoloration, or hemorrhage of the retina, and no changes of the optic disc. The retinal vein at the disc could even be seen to pulsate. Tension was normal. The patient complained of a "weakness" of the eye and some headache, and general weakness. The second patient, a woman of fifty years, had sudden failure of vision in the left eye following a cold. Although with this eye there was little more than a perception of light the external appearances of the eye were normal, and the pupil of the same size as that of the other, and reacted as well to light. After dilating the pupil with a solution of homatropin, no pathological changes whatever in the fundus of the eye were found. No lesions elsewhere apparent, and there was no hemianesthesia. The third patient was a woman of thirty years who, on the next day after an injury to the head, began to complain of dimness of vision in both eyes, and within twenty-four hours afterward she was unable to distinguish even light with either eye. At first she said there was a sense of "glare," and this gradually changed to total darkness or blackness. The expression of her face was the vacant stare of any blind person. At times her eyes pained her considerably, but were never reddened or watery. No evidence of fracture of the skull or injury to the brain could be found. After two weeks the only abnormal conditions apparent were the general physical weakness and the loss of vision, which was complete. No evidence of the slightest perception of the strongest light. The external appearances of the eyes were normal, and the movements of the balls and lids were unrestricted. The pupils were of equal and ordinary size and reacted normally. The optic discs, retinal vessels, and retinæ showed no variation from normal.

HINSDALE.

PATHOLOGY.

A Lecture on Yellow Fever, with a Description of the Bacillus Icteroides. (*British Medical Journal*, July 3, 1897.) By G. Sanarelli, M.D.

The bodies of those who die of yellow fever are either altogether sterile or are entirely invaded by certain microbic species, such as the streptococcus, the *Staphylococcus pyogenes*, the *Bacillus coli communis*, the proteus,

etc., which cannot in any way be considered as the cause of the malady. In the second autopsy which the author made he was fortunate enough to obtain, in a state of relative purity, an organism which he named the *Bacillus icteroides*. This is supposed to be the specific organism of yellow fever. It has never been met with alone; but always in association with one or more of the organisms mentioned above. In the case in which the organism was discovered, it was associated with the *Bacillus coli communis* only. The *Bacillus icteroides* should be sought for in the tissues and not in the gastro-intestinal tract, where it is never found. In yellow fever the digestive canal becomes the seat of an exaggerated pullulation of *Bacillus coli communis* which is met with in a state of almost absolute purity. According to the researches of the author, it is only possible to isolate the *Bacillus icteroides* in fifty-eight per cent. of the cases. The reasons for this are; first, because at the beginning of the disease the bacilli multiply very slightly in the human organism, a small quantity of the toxin being sufficient to produce a very grave picture of the disease; second, because the toxin, either by itself or indirectly by means of the profound lesions that it determines, particularly in the digestive mucosa and in the liver, facilitates in an exceptional way secondary infections of every kind. Such secondary infections may assume the type of a special septicemia, capable of killing the patient, or it is a mixed infection which presents nearly all the intestinal microörganisms. The *Bacillus icteroides* is a small organism with rounded extremities, for the most part united in pairs in the culture and in small groups in the tissues. It is from 0.002 to 0.004 mm. in length and, as a rule, two or three times as long as it is broad; is very pleomorphous; search for it in the tissues does not give good results unless the patient has succumbed before the development of any of the septicemias. In order to detect the organism in sections of the tissue, a small fragment of liver or kidney, for example, should be placed in the incubator for twelve hours, at 37°C. This treatment will favor the development of the organism, so that small groups can be seen in the capillaries. The bacillus develops on all the ordinary media. In gelatine plate cultures it presents rounded colonies which are transparent and granular and which, for three or four days, present the appearance of leucocytes. The granulation of the colony becomes progressively more marked and an opaque nucleus develops. In time the entire colony becomes opaque, without liquefaction of the gelatine. Streak cultures on gelatine-slants form brilliant, opaque drops, which resemble drops of milk in appearance. In meat broth it develops slowly, without forming a pellicle or flocculent deposit. On solidified blood serum it grows in an almost imperceptible manner. On agar-agar the growth presents a characteristic appearance which is of the first importance in diagnosis. When grown at a temperature of from 20° to 22° C. the colonies are like drops of milk, opaque, prominent, and with pearly reflections, completely different from the round, gray, iridescent,

transparent, and smooth colonies which develop in the incubator. The different manner of development can be utilized by exposing the cultures for the first twelve or sixteen hours to the temperature of the incubator and then keeping them for from twelve to sixteen hours in that of the room. The colonies then show a flat central nucleus, transparent and bluish, which is surrounded by a prominent opaque zone, the whole resembling a drop of sealing wax. As this character, which for the present may be considered specific, can fortunately be obtained, even in twenty-four hours, it serves to establish in the most rapid and certain manner the bacteriologic diagnosis of the *Bacillus icteroides*. The organism is a facultative anaërobe, does not resist Gram's stain, ferments lactose slowly, ferments glucose and saccharose more actively; but is not capable of coagulating milk; it strongly resists drying, dies in water at 60° C., and is killed in seven hours by the solar rays. It lives for a long time in sea water. The specific microörganism of yellow fever is pathogenic for all the mammals on which it has been tried; birds are completely refractory. Death in yellow fever may be caused; first, by the specific infection principally, when the *Bacillus icteroides* is found in the cadaver in a certain quantity, and in a state of relative purity; second, by the septicemias successively established during the course of the disease, when the cadaver presents an almost pure culture of other microörganisms; third, by renal insufficiency, when the cadaver is found almost sterile. The percentage of urea in the blood is very high and death takes place before the malady has reached the end of its evolutionary cycle. The toxin is a very active specific poison which is obtained by filtering the broth culture of the *Bacillus icteroides* which is twenty-four days old. The amarylligenous poison bears heating to 70° C. almost with impunity; but boiling sensibly attenuates it. If cultures sterilized by ether are employed the toxic power is much more active. The injection of the filtered cultures in relatively small doses reproduced in man typical yellow fever accompanied by all its imposing anatomical and symptomatological retinue. It being once demonstrated that all the striking phenomena of yellow fever are due only to the specific poison manufactured by the microörganism circulating in the blood, the disease immediately enters into the same class with typhoid fever. It is difficult to establish the way in which the microörganism enters the body; but it is probably transmitted both by air and water. Yellow fever once installed on board a ship is long and tenaciously maintained, because the common moulds of the atmosphere, which are the great protectors of the *Bacillus icteroides*, are to be found in ships. Experiments have shown that moulds when inoculated into gelatine tubes which have previously been inoculated with the *Bacillus icteroides* and which have remained sterile, will cause the *Bacillus icteroides* to develop simultaneously with the development of the mould. The heat and humidity of the holds of badly ventilated vessels, by favoring the development of the moulds, favor the development of the

Bacillus icteroides. It has been shown that this bacillus is very resistant to drying and possesses great longevity in sea water.

SWAN.

OBSTETRICS AND GYNECOLOGY.

A Suggestion in Regard to the Technique of the Alexander-Adams Operation. (*Centralbl. f. Gynäkologie*, January 30, 1897.) By Adolf Calmann, M.D.

The finding of the round ligaments either in the inguinal canal or at the external abdominal ring presents no great difficulties to the operator of skill or experience. The ligaments if drawn out of the canal the necessary distance, at least 8–10 cm., are capable of effecting the proper position of the uterus and are strong enough to maintain it. To guard against subsequent hernias the inguinal canal and the external abdominal ring should not be injured, but the ligaments should be caught up outside the ring and drawn through the canal. The anchoring sutures should be passed in the direction of the long axis of the ligament and not transverse to it, as is usually done. This avoids any possible necrosis of fibres of the ligament constricted by the sutures. The operation performed 32 times gave excellent results, and is, in the opinion of the author, entitled to first place among measures intended to correct movable retroflexions of the uterus.

L. S. SMITH.

A Contribution to the Knowledge of Tubal Pregnancy. (*Monatschr. f. Geburt. u. Gynäk.*, January, 1897.) By A. Martin.

Martin reports the case of a multipara that, having menstruated regularly, began to bleed continuously three weeks after an apparently normal period. The passage of clots and the appearance of milk in both breasts led to a diagnosis of abortion. Examination showed a uterus not perceptibly enlarged, with an adherent, soft, thin-walled tumor, the size of a fist, behind it on the right. At the operation, an anterior colpotomy, the mass on the right proved to be an ovarian cyst, which was removed. This did not explain the presence of the fresh, dark-colored blood and the older clots that were found in the pelvis, so a careful examination of the left appendages was made. In the middle of the left tube was a thickening 1 cm. broad and about 3 cm. long whose bluish-black contents shone through the thin tubal wall. The organized clots were removed through a slit made in the tube; this opening was sewed up with a continuous suture and the abdomen was closed. The patient made an uninterrupted recovery. Examination of the specimens showed that the case was a left tubal pregnancy, probably of two or three weeks' duration. The corpus luteum was in the undegenerated portion of the right ovary. The gestation had been interrupted very early in its development by the occurrence of menstruation, the ovum arrested in

its growth had been partially absorbed, as had the hemorrhage also that had taken place through the perfectly normal abdominal ostium. The pieces curetted from the uterus for diagnostic purposes showed no decidual changes, the decidua having been expelled probably when the bleeding began three weeks before. Such cases show that extra-uterine gestation may be arrested in its early stages and the ovum absorbed without the patient suffering any pathognomonic symptoms. "We must assume that extra-uterine pregnancy is much more frequent than we observe it, and that in its earliest stages it may be terminated without perhaps noticeable symptoms." Until it is possible to diagnose such arrest of development and beginning absorption of the ovum, expectant treatment is not advisable. Extra-uterine pregnancy as soon as diagnosed indicates operative interference.

L. S. Smith.

Concerning the Giant-Celled (Decidua-Like) Growths upon the Peritoneum and Ovaries in connection with Intra-Uterine Pregnancy. (*Monatschr. f. Geburt. u. Gynäk.*, January, 1897.) By Dr. Schmorl, of Dresden.

For a long time the presence of a new growth of tissue, composed of large cells similar to those of the uterine decidua, upon the pelvic peritoneum in connection with an extra-uterine implantation of the ovum was thought to be characteristic of abdominal or tubal pregnancy. Recently however Pels Leusden found the same nodular growths upon the pelvic peritoneum of a woman that had died of eclampsia during a uterine pregnancy. Schmorl found these also in thirty cases of intra-uterine pregnancy. They occur most often as grayish-white nodules of varying size, sometimes scarcely distinguishable from tubercles, often raised above a highly injected peritoneum and having a thin fibrinous exudate. These nodules may be confluent, forming patches, and less frequently they present a papillary appearance .5–1 cm. long. The favorite location is upon the walls of Douglas's pouch. They are found frequently upon the ovaries also. Microscopically they resemble uterine decidua closely, being composed for the most part of very large irregularly shaped branched cells containing a large readily stained nucleus. The nucleus contains a distinct nucleolus and is sometimes swollen and irregular in outline. In the newest growths the protoplasm of the cells is homogeneous and easily stainable with eosin. Hematoxylin stains it a gray-blue color. Here and there vacuoles are seen which in the fresh tissues are filled with shining globules giving the distinct glycogen reaction. Older growths show fatty, edematous, and mucoid degeneration. A minute description of the histology of the growths is given, and the author believes they are true new growths of peculiarly metamorphosed connective-tissue cells. The period of pregnancy in which they first appear is uncertain; they have been found as

early as the fifth month. They have not been found in any condition except pregnancy, and are therefore believed to be caused by some special irritation of the connective-tissue cells due to gestation. The growths usually disappear completely with the puerperal involution of the uterus, but sometimes remnants of them may be found in the shape of sand-like calcareous nodules in Douglas's pouch.

L. S. Smith.

The Importance of Scientifically Accurate Temperature Records in the Puerperium. (*Centralbl. f. Gynäk.*, April 17, 1897.) By O. Sarwey, M.D.

Sarwey calls attention to the injustice of a comparison of the percentages of pathological to normal puerperia as reported from the various lying-in hospitals, based upon the temperatures, unless there is a uniformity in the method and time of taking temperatures. If, as is now pretty generally accepted, 38°–38.2° C. (100.4°–100.7° F.) is to be regarded as the dividing line between a normal and an abnormal puerperium, every effort should be made to get as accurate a record of temperature as possible. Temperatures taken in the axilla are too liable to error to be taken as a basis for scientific classification; he therefore advocates the rectum as being most accurate. He has never seen any bad effects to counteract the advantages during the past twelve years, in which all temperatures have been taken in the rectum in wards of the University Frauenklinic in Tübingen. Uniform rules should be adopted in the various hospitals to obtain accurate statistics in regard to the conditions of a hygienic puerperium. 1. All temperatures should be taken daily, during the first week of the puerperium, between 6 and 7 A.M., and 4.30 and 5.30 P.M., and must be carefully recorded. 2. Temperatures should be taken preferably in the rectum, with every precaution against error. 3. 38.5° C. (101.3° F.) in the rectum should be accepted as the dividing line between the normal and the abnormal. 4. Elevations of temperature are to be classified according as they: (*a*) have no apparent cause, with absolutely normal involution of the genital organs, (*b*) have demonstrable causes in a local or general infectious process, or (*c*) have causes of a purely accidental nature without connection with puerperal processes in the genitalia. 5. Accurate data of the whole course of the febrile disturbances in the individual cases are required. 6. The mortality must also be reported in connection with the statistics of abnormalities, with, when possible, the causes of death as determined by autopsies.

L. S. Smith.

The Etiology and Therapy of Eclampsia. (*Centralbl. f. Gynäk.*, April 3, 1897.) By Paul Kollman, M.D., of Dorpat.

Kollman believes that fibrinogen, a globulin, is the poison which causes

eclampsia. Nasse showed that the amount of fibrin in the blood of pregnant women is always in excess, but Kollman found it still more so in the blood of eclamptics. With this showing up of the fibrin-forming elements of the blood at the end of pregnancy there is a decreased toxicity of the urine of eclamptics, showing that less albuminoid materials are excreted than normal. The favorable influence that delivery exerts upon the eclampsia gives the indication for the *accouchement forcé*, as advised by Dührssen, when it can be accomplished rapidly by either incising the undilated cervix or by dilating it by the intra-uterine *metrerynteur*. If delivery fails to check the progress of the eclampsia, venesection is recommended, to remove a portion of the poisonous material from the system, the amount of fluid lost being replaced by water absorbed.

L. S. Smith.

I. Vaginitis Gonorrhoica after Removal of the Uterus. (*Monatschr. f. Geburt. u. Gynäk.*, January, 1897.) By A. Döderlein.

II. In Regard to the Knowledge concerning Vaginitis Gonorrhoica. (*Monatschr. f. Geburt. u. Gynäk.*, January, 1897.) By Ludwig Mandl.

I. Döderlein reports a case of vaginitis in which the gonococci were found in the purulent discharge of a patient from whom he had removed the uterus and appendages three months before. Unfortunately a portion of the highly inflamed vaginal mucous membrane could not be excised for microscopical examination. In the report of the case no mention is made of the condition of the urethra, although great stress is laid upon the fact that the vaginal inflammation could not have been caused by any irritating discharge from an infected uterus and cervix. II. Mandl was led to make careful microscopical examinations of small pieces excised from the vaginal walls of patients in whose discharge gonococci were present and whose vaginal mucous membrane showed signs of inflammation. In the three cases thus selected he was able to demonstrate the presence of gonococci in the layers of the epithelium and in the sub-epithelial connective tissue. "A vaginitis occurring in the course of an attack of gonorrhea may be caused by the gonococcus itself. There may be a true gonorrheal vaginitis even in adults, and even the thick squamous epithelium of the vagina affords no sure barrier to the invasion of the gonococcus."

L. S. Smith.

Sarcoma of the Uterus. (*British Gynecological Journal*, May, 1897.) By W. Roger Williams, F.R.C.S.

All forms of sarcoma met with elsewhere are found in the uterus, and, contrary to prevailing belief, it appears that the cervix is as often affected as the corpus. It is a rare disease. The author's analysis of 2,649 consecutive cases of primary uterine neoplasms comprise only two sarcoma and Gault's analysis of 4,115 uterine neoplasms only eight. Lately the con-

siderable number of cases reported suggests the probability of the disease being rather more frequent. For descriptive purposes uterine sarcoma may be divided into: (1) Infantile forms; (2) grape-like or botryoidal; (3) sarcoma of the mucosa; (4) sarcoma of parenchyma; and, (5) deciduoma malignum. Of 73 uterine sarcoma tabulated by Gusserow only four originated under twenty years. These are usually polypoid multiple tumors from the inferior segment of the uterus and often accompanied by polypoid excrescences of the adjacent mucosa. Probably most infantile forms are of blastogenic origin. As a rule, they recur rapidly and are highly malignant. The grape-like or botryoidal form also grows from the inferior part of the uterus into the vagina. They form pedunculated grape-like masses, soft, easily detachable, and gelatiniform in aspect; are highly malignant, progress rapidly, recur quickly, and are very apt to disseminate. Sarcoma of the mucosa is the commonest form. It originates from the connective tissue elements and usually assumes the form of a diffuse infiltration with the production of numerous rounded nodules or polypoid bosses, which, in the body of the uterus, are apt to attain large size and cause thinning and weakening of its wall. In sarcoma of the parenchyma the disease usually assumes a circumscribed form, resembling fibro-myoma, but without a distinct capsule. The so-called recurrent fibroids; this form may arise from fibro-myomata, but not necessarily so. A large proportion of these cases are absolutely or relatively sterile. The symptoms are like those of cancer and an examination shows the uterus enlarged and indications of a tumor connected with it, but a positive diagnosis can only be made by the microscope. The prognosis after operation is not as good as in cancer. Deciduoma malignum is a special variety of malignant disease coincident with pregnancy and tending to run a rapidly fatal course. Symptoms first appear soon after parturition, usually an abortion or passage of hydatid mole, and are, irregular metrorrhagia, fetid discharge, cachexia, emaciation, anorexia, nausea, and vomiting. There may be pain and fever. The uterus is bulky and irregular, with intrauterine masses or soft areas, and the microscope completes the diagnosis. It is especially apt to invade the blood-vessels and so gives early and wide metastasis. It is highly malignant. Of fourteen cases operated upon, only six are reported alive still within one year of operation. The author gives notes of several cases under each class and refers to many others.

GIRVIN.

Cases of Inversion of the Uterus. (*Edinburgh Medical Journal*, July, 1897.) By R. J. Kinkead, M.D.

This accident occurs usually immediately after labor, either before or after the discharge of the placenta. It should be easy to replace if attempted at once, but difficult or impossible if allowed to become chronic. The author mentions the following causes: Efforts to extract an adherent

placenta, Creede's method of expressing placenta, and paralysis of placental site, but believes the latter really due to a partially adherent placenta which becomes detached after it has caused a partial inversion. There are three stages of inversion: first, a cupping or depression of central part of fundus; second, introversion, where so great a part of the fundus falls in as to be gripped by the uterine wall, and, in extreme cases, present at the uterine os; and, third, perversion or complete inversion into the vagina. In this division the fundus is always the presenting part, but the author believes that any part of the uterine wall may prolapse, and quotes a case where the anterior wall was the presenting part. He also reports a case due to traction on an adherent placenta which was easily replaced, and a chronic case of seven months' standing successfully treated by Aveling's sigmoid repositor.

GIRVIN.

Antistreptococcic Serum in the Treatment of Puerperal Fever. (*British Medical Journal*, July 3, 1897.) By J. F. C. Whittingdale, M.B.

The author briefly reports a case of puerperal fever following a difficult forceps delivery and severe laceration of the perineum, in which two injections of antistreptococcic serum were followed by rapid recovery. On the fifth day after delivery the temperature was 103° F. At this time he injected 10 c. c. of Bullock's serum, which was followed by profuse perspiration and a lower temperature, but the temperature again rose and on the seventh day he repeated the injection, after which the temperature fell to normal and the wound, which had been packed with iodoform gauze, took on a healthy appearance. A free perspiration continued for several days, but the recovery was rapid. He reports another case where puerperal fever was present in which he used the same injection, but which proved, on the next morning, to be scarlet fever. Here there were no bad effects from the use of the antistreptococcic serum.

GIRVIN.

A Contribution in Regard to Operation on the Retroflexed Uterus. (*Centrlb. für Gynäk.*, March 13, 1897.) By Julius Elischer.

The uterus, non-adherent or freed from its adhesions, is drawn down toward the vulva by a tenaculum. A transverse incision is made on the anterior aspect of the vaginal cervix, the bladder is dissected up and the utero-vesical pouch of the peritoneum is opened. The fundus is drawn forward through the opening thus formed and the whole uterus is brought outside the vulva. It is then held in anteflexion and, beginning at the angle of flexion, a flap 2.5 to 3 cm. broad is cut inwards and upwards toward the fundus. On the anterior surface of the cervix, just below the angle of flexion and therefore just below the initial incision for the flap, a raw surface 2 cm. broad is made across the cervix. The uterus is then flexed more sharply and the circular edge of the flap is sutured to the lower

border of the raw surface just described. The uterus is then replaced and the wound in the anterior vaginal vault closed as in an anterior colporrhaphy. The author claims for this operation that it produces a permanent anteflexion of the uterus without fastening it in a pathological position as is done by either ventral or vaginal fixation. He has done it now eleven times and has found the results perfect after seven, eight, and eleven months' observation. One of the earliest cases is now pregnant and progressing normally.

L. S. Smith.

Regarding the Origin and Treatment of Hematoma Vulvæ after Labor. (*Centrlb. f. Gynäk.*, March 13, 1897.) By H. Löhlein.

Löhlein refers to three cases that came under his notice some years ago and reports two others that he has seen more recently. The first case followed a slight wound on the inner surface of the left labium minus caused by a forceps delivery of a patient with chronic nephritis with considerable edema of the labia. The hematoma, as large as a closed fist, began in the left labium majus and extended back into the perineum. The suggestion is offered that the edema may have been the predisposing cause of the extravasation into the tissues. Case II. followed a slight bilateral tear of the vestibule caused by precipitate expulsion of the head. The hematoma occurred in the left labium. In both cases an incision was made, the clots cleaned out and further hemorrhage stopped by sutures and packing. This active treatment the author advises whenever the amount of the extravasation is sufficient to cause considerable pain by the tension of the skin.

L. S. Smith.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

THE WANT OF GOOD MORAL CHARACTER IMPLIED IN CONVICTION FOR FELONY FORFEITS THE RIGHT TO PRACTICE MEDICINE.

The Court of Appeals of New York has sustained the conviction of one who had been indicted for practicing medicine after having been convicted of a felony, a statute of the State forbidding such practice.

The indictment charged that on March 6, 1878, the defendant was convicted in the Court of Sessions of Kings County of the crime of abortion, upon which he was sentenced to be imprisoned in the penitentiary of

Kings county for the term of ten years; that afterwards, on February 22, 1896, at the city of New York, he did unlawfully practice medicine by examining, treating, and prescribing for one H., against the form of the statute in such case made and provided.

To this indictment it was objected, in behalf of the defendant, that the facts stated in the indictment did not constitute a crime, inasmuch as the statute alleged to have been violated is prospective in its application, or, if it is not so prospective, it is null and void, as being in violation of Article 1, Section 10, of the Constitution of the United States, and of the fifth amendment to said Constitution, and also of Article 1, Sections 1 and 6, of the Constitution of the State of New York. These objections being overruled, the jury returned a verdict of guilty, and the defendant was sentenced to pay a fine. From this judgment an appeal was taken to the Appellate Division of the Supreme Court, which reversed the judgment of the lower court, but the Court of Appeals reversed the judgment of the Appellate Division and sustained the judgment of the trial court.

The indictment was under the Public Health Law, Section 140 of which provides: "No person shall practice medicine after September 1, 1891, unless previously registered and legally authorized, or unless licensed by the regents and registered as required by this article; nor shall any person practice medicine who has ever been convicted of a felony by any court, or whose authority to practice is suspended or revoked by the regents on recommendation of the State board." Section 153 provides, *inter alia*, that "any person who, after conviction of a felony, shall attempt to practice medicine, or shall practice, * * * shall be guilty of a misdemeanor, and on conviction thereof shall be punished by a fine of not more than two hundred and fifty dollars, or imprisonment for six months for the first offense, and on conviction of any subsequent offense, by a fine of not more than five hundred dollars or imprisonment for not less than one year, or by both fine and imprisonment." This statute, it was contended, should be construed prospectively.

"Undoubtedly," said Mr. Justice Haight, delivering the opinion of the Court of Appeals, "it has reference only to misdemeanors committed after the passage of the Act, but as to the felony charged as the former offense we think it has reference to those committed before as well as after the passage of the Act. The provisions of that Act are part of the public health law of the State, which provides a system for the preservation of the public health and the practice of medicine, and its provisions, so far as possible, should be construed as in harmony with each other. Section 140 prescribes the qualifications of persons who shall be permitted to practice medicine, and prohibits all persons not so qualified from engaging in such practice, including those who have never been convicted of a felony. Section 153 provides for the punishment that shall be inflicted upon those who violate the provisions of the law. If the provisions of Section 153

stood alone, unexplained, there might be some basis for the contention that it was intended to relate only to felonies thereafter committed; but, when it is read in connection with the provisions of Section 140, it seems clear that such a construction was not intended, for that section expressly prohibits any person from practicing medicine 'who has ever been convicted of a felony.' The word 'ever,' to our minds, clearly indicates the legislative intention to prohibit the practice of medicine on the part of any person who has been convicted of felony either before or after the passage of the law."

Is the law in question violative of Article 1, Section 10, of the Constitution of the United States, which provides that no State shall pass any bill of attainder or ex post facto law?

As to the contention that the provisions of the law constitute a bill of attainder, the Court were clearly of the opinion that it possessed none of the characteristics of a bill of attainder; for, if it does, then every statute which provides an additional punishment for the commission of a crime after a former conviction must fall within the condemnation of the Constitution. A bill of attainder in England, they having been abolished by the Constitution of the United States, was understood to be the stain or corruption of the blood of a criminal capitally condemned, the effect of which was that the party attainted lost all inheritable quality, and could neither receive nor transmit property or other rights of inheritance. Such bills were acts of Parliament relating to specified person or persons usually named in the acts, in which they were convicted, sentenced, and punished without a judicial trial, and generally without the presence of the accused or his counsel, or an opportunity to be heard, or to establish his innocence. It is clear that the public health law has none of these characteristics of a bill of attainder.

"A more serious question," continues the Court, "is presented with reference to the contention that the law is ex post facto. An ex post facto law is defined to be one that punishes as a crime an act done before its passage, and which, when committed, was not punishable; and an act that aggravates a crime or inflicts a greater punishment than the law annexed to it when committed, or a law that alters the rules of evidence in order to convict an offender. It is not contended that the law in question makes any change with reference to the felony of which the defendant was convicted, or that there has been any aggravation or change with reference to the punishment provided therefor. What has been done is the creation of a new offense—a misdemeanor after a felony, dependent upon acts thereafter committed in violation of the statute, and providing a punishment for such misdemeanor. It is in the nature of providing punishment for a second or an additional offense, and it is claimed with reference thereto that it operates to deprive the defendent of his rights of property, of his right to earn a living by the practice of medicine, and that by being

deprived of this right the effect is to aggravate his punishment for the felony. The difficulty, however, with the contention is that it does not appear from the record in this case that he ever had any right to practice the profession of medicine, and that no presumption can be indulged in to that effect. The felony of which he was convicted was not based upon the charge that he was a physician, or a practitioner of medicine. He was charged with having committed an abortion, and upon this charge he was convicted. Whether he was a physician or not was entirely immaterial, so far as determining whether that crime had been committed. It does not now appear that he ever studied medicine a day in his life, that he ever received a diploma from any medical college or university, that he was ever registered or licensed to practice medicine, or that he ever did practice medicine before February 22, 1896, the day of the charge upon which the indictment in this case was founded. So that there is an entire absence of any evidence showing or tending to show that he was deprived of any rights of property, or of means of earning a livelihood that he heretofore enjoyed and possessed.

"One of the highest functions of government is the preservation of the public health. It was for this purpose that the law in question was enacted. Under it delicate and important duties are intrusted to physicians, involving skill, ability, learning, and integrity. The constitution provides that no person shall be deprived of life, liberty, or property without due process of law, yet this provision of the organic law is made subordinate to that of paramount necessity, and the rights secured thereby to the citizen must yield to that of the preservation of the public health. The property of a citizen may be seized and burned if, in the judgment of physicians, it is infected, and liable to cause the spread of contagious disease. He may be certified into an insane asylum, or carted away to a pest house, and there restrained and imprisoned, if, in the judgment of the physician, such a restraint and detention is advisable; and under certain circumstances the physician, in his practice, may destroy life if, in his judgment, it be necessary to save another life. Aside from these important duties and privileges, the physician is admitted into the family circle. He is intrusted with the family secrets of physical ailments and defects. He is permitted to administer powerful drugs and poisons, and is intrusted with the care of the lives, health, and welfare of its members. The patients as well as the public are deeply interested in having the person in whom such trust and confidence is reposed possess all the skill, ability, learning, and integrity that is required for the proper and faithful discharge of the duties and trust reposed in him. The legislature, therefore, in the exercise of its discretion under the police powers of the State, may, by act, impose reasonable conditions and requirements under which individuals may practice the profession of medicine, and restrain and prohibit all persons not complying therewith from engaging in such practice.

"One of the conditions so imposed upon persons who seek to practice medicine, is that they shall possess a good moral character. The presumption of bad character attaches to a person convicted of a felony. Formerly, it was not thought safe to allow him to be sworn as a witness. He may now be sworn, and give his testimony, but the fact that he is a felon may be shown to impeach his credibility, and the jurors, in the exercise of their judgment, may disregard his testimony. The defendant knew, at the time he committed the felony, that the presumption of bad character would follow his conviction, and that he would have to bear the resulting consequences. If, therefore, the legislature may impose conditions upon which persons of good moral character shall engage in the practice of medicine, and may impose a punishment for all persons violating the conditions, it appears to us that the legislature may also prohibit from practicing a person who has been convicted of a felony, whose character is presumed to be bad, who has never before studied or practiced medicine, and who has not conformed to a single condition or requirement of the statute under which other persons are licensed to practice. The defendant has been deprived of no rights secured to him either by the United States or State constitutions. The judgment of the Appellate Division should be reversed, and that entered upon the conviction affirmed, and the proceedings should be remitted to the Court of General Sessions of the Peace for the City and County of New York, there to be proceeded upon according to law."

The justices were not unanimous, however, in this opinion; one dissented entirely from the general result; another gave as his reasons for dissenting: *first*, The statute is wholly prospective; *second*, the statute in question punishes the defendant for an offense committed twenty-five years ago, and of which he was then convicted, and for which he was punished. This statute plainly inflicts an additional punishment, and is in conflict with the constitution. Two other justices concurred in the general result solely on the ground that the record contains no evidence that the defendant, at the time of his conviction, or at any other time, was a physician.

BOOK REVIEWS.

Diseases of the Ear, Nose, and Throat and their Accessory Cavities. A Condensed Text-Book. By Seth Scott Bishop, M.D., LL.D., Professor in the Chicago Post-Graduate Medical School and Hospital; Illustrated with 100 Colored Lithographs and 168 Additional Illustrations. One Volume, Royal Octavo, pages 496. Extra Cloth, $4.00 net. The F. A. Davis Co., Publishers.

This admirable treatise may be said to fill a decided want in medical literature, being almost the only volume of its type by an American author. The usual introductory subjects are very carefully treated, and the modern methods of examination and treatment carefully outlined. About 100 pages are devoted to diseases of the middle ear, and the advice given is, generally speaking, thoroughly in accord with the best modern views. Excision of the ossicles is considered without prejudice, and the author appears to be decidedly against its employment in sclerotic cases. Diseases of the mastoid are particularly well illustrated, and the best methods of operation are described with great clearness and detail.

The section of the book upon nasal diseases is hardly so satisfactory as the preceding chapters, but most of the descriptions are clear, and the therapeutic advice is throughout characterized by moderation and fairness to opposite opinions. Hay-fever receives the most elaborate treatment of all diseases in the book, 27 pages being occupied by its consideration, the author's well-known views upon the subject being thoroughly aired. Adenoids are disposed of in but five pages, and the only method of operating which seems to be advocated is ethyl-bromide anesthesia, and the use of Gottstein's ring curette. Under the heading of diseases of the pharynx, diphtheria receives the most elaborate consideration; serum therapy is very carefully discussed, and the author's opinion, after careful weighing of evidence, seems to be favorable to its use. The larynx is somewhat briefly disposed of, which could hardly be avoided in a book of the kind. No important point has however been omitted, and the illustrations are especially graphic and commendable. The reviewer regards Dr. Bishop's book as an exceedingly useful contribution, and takes pleasure in endorsing it in the highest terms.

R. W. S.

Hysteria and Certain Allied Conditions. By George J. Preston, M.D., Philadelphia: P. Blakiston, Son, & Co. 1897. 8°, cloth. $2.00.

Dr. Preston has furnished us with a convenient and comprehensive volume of about three hundred pages on this important subject. It is a singular fact that there is no other recent English text-book on this subject, so remarkable in its history, protean in its forms, and, for the most part, so amenable to treatment. The ancient view of hysteria was that of a direct connection with the womb, and the author quotes Democritus, who said, in a letter to Hippocrates, that the womb is the origin of six hundred evils and innumerable calamities. The subject is well handled by the author and treated in a conservative and attractive style.

Dr. Preston's observations on hysteria in the negro race are to the effect that paralysis of motion, or sensation, or long-continued contractures are less common than in the white race. But convulsive seizures and more or less completely de-

veloped major attacks are very common, as are paresthesia and mental hysteria. Dr. Preston is inclined to believe that hysteria is more frequent in this race to-day than it was during the slavery period; but, as the doctor never saw a slave, it is naturally difficult to form a correct opinion on this point. The author notes that as a race develops the wilder features of the contagious hysteria of the uncivilized become less and less frequent, and in their place are seen the less obtrusive forms, particularly the purely mental form.

Seventy pages are devoted to treatment. Hydrotherapy is strongly endorsed. "No other single agent has been as useful in my hands as this." He says that in employing drugs in hysteria they should be used with a view to the mental impression produced, more than for their absolute physiological action, and cites the valuable influence of asafetida, musk, valerian, sumbul, etc., as due to their peculiar and striking odor. Capsules of valerianate of ether are highly commended. All forms of magnetic treatment and metallo-therapy are held to be of value only from a psychic standpoint. As to hypnotism, the author says that "there can be no doubt of its great utility in the treatment of many of the so-called accidents of hysteria—paralysis, contractures, mutism, convulsive attacks, and the like.

The book is beautifully printed and bound, and the index is good and covers the subject fully.

G. H.

A Manual of the Practice of Medicine: Prepared Especially for Students. By A. A. Stevens, A.M., M.D., Instructor in Physical Diagnosis in the University of Pennsylvania; Physician to St. Agnes' Hospital; Physician to Out-Patient Department, Episcopal Hospital, etc. Philadelphia: W. B. Saunders. 1897.

Four editions in as many years and a translation into Italian speak well for any book, but especially well for a manual of the practice of medicine. Dr. Stevens, from his long experience as a quiz-master, knows well the need of students preparing for university and hospital examinations, and that he has supplied their wants is best attested by the success of the book. The student needs an outline of so extensive a subject as the practice of medicine, and Steven's Manual and Norris's Syllabus of Obstetrics are far superior to the old compends with question and answer. The necessary material is contained in these books, but it is so condensed as to require attendance upon lectures and quizzes or more extensive reading.

In the present edition, as compared with the first, the following changes are noticeable: A section on the examination of blood and gastric contents is added; the pathology of malaria is rewritten. The occurrence of posterior sclerosis in pernicious anemia is noted, as well as the possible etiological relation of auto-intoxication to chlorosis. The sections on empyema and the blood in leucocythemia are enlarged, and, under scurvy, Barlow's disease or infantile scurvy is noted. The use of thyroid extract in myxedema and of antitoxin in diphtheria one naturally expects to find in the new edition, and is not disappointed. For the student who has attended his lectures and quizzes and read his larger works on practice, and who wishes a bird's-eye view of the subject, no better help can be suggested.

J. E. T.

Elementary Bandaging and Surgical Dressing. By Walter Pye, F.R.C.S. Revised and in part rewritten, by G. Bellingham Smith, F.R.C.S., Surgical

Registrar, Guy's Hospital. Philadelphia: W. B. Saunders. 1897. 16mo, cloth, 75 cents.

This is the seventh edition of a compact and comprehensive manual for the dressing of surgical cases and the treatment of accidents and emergencies. It is well illustrated.

Lectures on Angina Pectoris and Allied States. By William Osler, M.D., Fellow of the Royal College of Physicians, London; Professor of Medicine, Johns Hopkins University, Baltimore. New York: D. Appleton & Company. 1897.

We have nothing but words of commendation for this little volume, the perusal of which proved as entertaining as one of Barrie's novels. Dr. Osler is particularly happy in the narration of cases, and in the book before us his ability to bring out salient features of a case and make it not only instruct but interest the reader is specially well exemplified. The book also shows that he is a careful and discriminating recorder of his cases. The students of Johns Hopkins Hospital Medical School are to be congratulated and envied for their opportunity of hearing such lectures.

The subject is thoroughly and practically presented, and there is a most refreshing lack of that disputatious and argumentative spirit which seeks to prop up some pet theory or propound a new one. This is particularly noticeable in the chapter entitled "Theories of Angina," which, if it does not leave the reader any more settled in his notions than he was before, will yet be found highly instructive. We were specially pleased to see that Osler retains the expression "pseudo-angina" in contradistinction to those cases in which the pain depends upon demonstrable organic disease of the heart. "Herein lies the essence of the whole matter; the symptoms, on the one hand, indicate the existence of a grave organic, usually incurable malady, and, on the other, a condition very distressing, it is true, but rarely serious, and usually curable." Again let us quote a few sentences which seem to us to present a comprehensive statement of the etiology of true angina and of the insufficiency of our knowledge of the same. "The predisposing causes of angina pectoris vera are those of arterio-sclerosis; that is to say, so intimately associated is the true paroxysm with sclerotic conditions of the coronary arteries that it is extremely rare apart from them. * * * * Gout, syphilis, and heredity influence the causation only so far as they tend to produce sclerotic changes in the arteries; but it would be altogether too narrow a view to suppose that the etiology of the disease is identical with that of arterio-sclerosis. The one is so common and the other so comparatively rare, even among the individuals most prone to sclerosis, that there must be a third element, an indefinite something which yet escapes our knowledge, but which is the essential factor in the production of this terrible affliction.

Although the book offers nothing new on the subject, and would therefore be a disappointment to those who are interested only in what is new, it yet deals with the subject so fully but tersely that it will prove an important addition to every practitioner's library.

R. H. B.

Annual of the Universal Medical Sciences and Analytical Index. A Yearly Report of the Progress of the General Sanitary Sciences Throughout the World. Edited by Charles E. Sajous, M.D., Paris, and seventy Associate Editors, assisted by over two hundred Corresponding Editors, Collab-

orators, and Correspondents. Illustrated with chromo-lithographs, engravings, and maps. 5 volumes. F. A. Davis Company: Philadelphia, New York, Chicago. 1896.

It is probable that the 1896 issue of the Annual of the Universal Medical Sciences will be the last to appear in its present form of five volumes. The return of Dr. Sajous to America from Paris, and the financial stringency of the times, point toward the Annual being issued hereafter as one volume. This gigantic American enterprise, like that of the *Index Medicus*, is appreciated and praised by all, but approval, in the way of cash subscriptions, is not forthcoming. To show one of the uses to which the Annual is put, the reviewer would state that, when one of the associate editors in therapeutics, he had the pleasure of seeing matter quoted *verbatim* from his section by certain authors, but, alas! credit was not given to the abstracter, editor-in-chief, or publisher.

The analytical index and cyclopedia of treatment by Dr. Sajous, an article of 327 pages, contains excellent critical remarks by the various associate editors and is a new and valuable feature of the work.

The references cover the year 1895, extending several months both before and after this date. The readers of the INTERNATIONAL MEDICAL MAGAZINE will recognize in number 451 many of the articles and illustrations which have appeared in this journal.

H. W. C.

THE FREE OPENING OF THE TYMPANUM AND ITS ANNEXES. By Dr. E. J. Moure (Bordeaux).

In this brochure of 65 pages, M. Moure quotes from Stacke, Küster, and Bergmann as to the earlier presentation of the subject, ascribing to Küster the credit of inaugurating, and to Stacke, Bergmann, Schwartze, and Hartmann of popularizing the freeing of the tympanic cavities for the cure of rebellious otorrhea. He cites nineteen interesting histories from among 59 cases so operated on by himself in the last two years; and concludes: "Always in the presence of old and fetid otorrhea, rebellious to ordinary treatment, if one surmises the existence of bone-lesion or still more of cholesteatoma-masses, he should not wait for the supervention of complications before operating. He should open freely the antrum, aditus, and attic, and throw into direct communication the three portions of the ear, obliterating all bony partitions between and below them, in order to remove the causes of the suppuration. This operation, prudently done, may be considered innocuous." In 59 operated cases of the last two years he has had no deaths ascribable to the operation; four died a few months after—two of them of acute tuberculosis, one of erysipelas, and a diabetic of meningitis five days after trephining. One case, with symptoms of lateral sinus phlebitis, recovered.

His comprehension and presentation of the anatomical relations has the usual European fault of considering the antrum as the major cell of the mastoid instead of the upper posterior cavity of the tympanum, as set forth by Leidy. And hence, as does Küster, he confounds suppuration and caries limited to the tympanum (including the antrum, attic, and aditus) with disease of the mastoid process and its cells. Instead, therefore, of freely opening the tympanic cavities in Stacke's original manner and then following the disease outward only so far as it is found to have spread, operators are too prone to chisel away needlessly the whole posterior wall of the canal and perhaps the whole of a sound mastoid process. The blunder may not be serious in spite of the absorbing surfaces thus made; but it is essentially bungling and undesirable in the majority of the cases under consideration, where "mastoid" symptoms are absent.

As in other similar publications, he rarely gives details as to the completeness of the cure, still less as to its permanency. This is the essential point, for the operation is largely one of election, done for the rapid and total cure of suppuration and its dangers, possibly remote. If the cure is not speedy, complete, and permanent, it will not generally be accepted by the profession and the laity until the "loose screw" has been adjusted to a more certain point. It is a step in the right direction and is improving our technic and our pathological knowledge, but it must be conceded to be tentative until the statistics become full and authoritative enough to assure it (or its successor) a better status. This must be the stand of the honest operator who is doing it, as well as of the skeptic who opposes.

B. A. R.

PHYSIOLOGY FOR BEGINNERS. By Foster and Shore. New Edition, with Additions. The Macmillan Company, 66 Fifth Avenue, New York. 1897. Pp. 247. Price, 75 cents.

It would be a work of supererogation for the writer to commend a work which Michael Foster has supervised, and for which he holds himself equally responsible with the actual author, Dr. Shore; but, authorship aside, the book is one of the very best of those designed to give a sound knowledge of elementary physiology to both younger and older students. Without redundancy or the introduction of irrelevant matter, and without being tiresome the text is concise and easily understood; the illustrations are excellent, both as regards selection, number, and execution, and the typography and book-work are such as we naturally expect from the publishers. So far as we know there is nothing to excel it to-day among any of the primary or secondary text-books of physiology, and we feel that it can be conscientiously recommended to all who, like ourselves, have felt the need of just such a volume.

S. E.

HYGIENE FOR BEGINNERS. By Ernest S. Reynolds. With 100 Illustrations. The Macmillan Company, 66 Fifth Avenue, New York. 1897. Pp. 235. Price, 70 cents.

We regret that we cannot give the same high praise to this volume as to the one just reviewed, but must confess that, except for certain special cases, we cannot see its cause for being. Except for the last twenty-three pages, devoted to a useful, but too brief chapter on medical and surgical emergencies, and to the index, exactly one-half of the book is given to elementary physiology and anatomy, the treatment of which subjects, though good, is, on account of the limited space, by no means so satisfactory as in the more complete work of Foster and Shore. As for the balance, which is devoted to the title-subject of the book, the teaching and illustrations are both good, though at times manifesting certain British peculiarities, or habits of practice, by no means common in this country, and which, having no features of superlative excellence over those in vogue here, might just as well be changed or omitted in a book intended for circulation among American students. Moreover, hygiene at this time has such a dignity and scope that it cannot, we think, be at all rightly or comprehensively treated in such limited space; and, therefore, either as a text-book on anatomy, physiology, and hygiene combined, or one on hygiene alone, we can scarcely feel that it will prove of any great value, except, as stated, in special cases.

S. E.

CLINICAL LESSONS ON NERVOUS DISEASES. By Weir Mitchell, M.D., Member of the National Academy of Sciences; Honorary Fellow of the Royal Medico-Chirurgical Society of London. Philadelphia and New York: Lea Brothers & Co. 1897. 8°. Pp. 305.

The author has utilized the rich clinical material of the Infirmary for Nervous Diseases in Philadelphia and the Pennsylvania School for Feeble-Minded Children, and thus gives to the profession many rare cases of nervous disease in a permanent volume. The service which Dr. Mitchell has for many years been rendering to brother physicians is increasing, and the present volume, with its sixty-nine cases and clinical comments, adds one more to his long list of scientific publications, now numbering in the neighborhood of one hundred and thirty. Dr. Mitchell believes that a hospital fails in its duty to the public unless it unfolds and disseminates the truths of medical science, and no one can be associated with him unless he does his share in advancing the art and science of medicine.

G. H.

FADS OF AN OLD PHYSICIAN: A SEQUEL TO "A PLEA FOR A SIMPLER LIFE." By Geo. S. Keith, M.D., LL.D., F.R.C.P.E. London: Adam and Chas. Black, 1897. The Macmillan Company, 66 Fifth Avenue, New York. Price, $1.00.

At a very advanced age Dr. Keith writes this very charming book, filled with reminiscences, and containing as its kernel a great truth. He remarks that he has been called "the apostle of hot water," but "apostle of starvation" would come nearer, for he leads the forlorn hope against the modern fashion of feeding sickness and "keeping up" the system. For the ancients—*i. e.*, the doctors of all the generations till our own—starved fevers, yet were themselves gluttons in a gluttonous age; and, when the new leaf was turned, and "He fed fevers" was considered a laudatory epitaph, and Thomas King Chambers wrote his "Renewal of Life," and Hughes Bennett extolled the hitherto unknown virtues of expectancy, the medical world entered its sick corps upon a grand orgie of food and drink. The rich viands of the older time, that brought sickness and torpor on their consumers, were not rich and delicate enough, and the time-honored three or four meals yielded to forced and continuous feeding. It seemed in those days that a great light shone, but behind it was the shadow, existent but forgotten, and, while the forced feeding saved some, there were others that were literally stuffed to death.

Against over-eating Dr. Keith narrates his own personal history and the history of his own successful practice. If Dr. Keith had possessed a good digestion himself he would never have been led to pity and succor the dyspeptic, but from one, and that one himself, he learned to aid others, for as a wise man he knew that he was no isolated case. Each man, each curious case of disease is one of a class, which grows more numerous as the sharpened eye seeks it.

But while we admit the value of his ideas and consider that he has given us a fair, unprejudiced account of his professional successes with low diet, we can but think that both he and Dr. Dewey, whose works and theories seem to have attracted him, are alike suffering from the want of a reasonable working theory or explanation of their method. Dr. Keith lauds everywhere the value of diminished food. To him, man is a many-headed glutton, gorging itself through a million mouths, and so he cries out for less food. Animal food he in his heart detests. Dr. Dewey's plan of "no breakfast" is good to him because it means one meal less, and if the United States could produce a

man who advocated no breakfast or dinner either, Dr. Keith's admiration would know no bounds. He hints again and again at the removal of that second meal. His illustrative cases are mostly, if not always, cases of delayed digestion, irritable stomach, and gastric reflexes. He sees them all, as it were, through his own stomach. Were he an oculist, many of these cases would, by a well-known transformation, become "eye reflexes;" were he himself a gouty man, "gouty indigestions;" but in either case his method of relieving the stomach of a load it cannot manage, of keeping food away from the case that loathes it, is useful, and will produce, when properly employed, remarkable results; just as remarkable as the wonderful results sometimes seen from forced feeding. Still there is a lack of definite system, and in following his plan one would be in doubt just what to do. Dr. Dewey, too, in his "no breakfast" hobby, misses a rational reason; in fact there are many reasons why breakfast is *not* the best meal to omit, and, to go further, the whole scheme is not one of diminishing real food and nourishment at all, but in getting a good digestion for two meals where there was a bad one for three (Dr. Dewey), or for less food (Dr. Keith), when previously all the efforts at assimilation had been balked by gastric delay, distress, and misdirected effort. The real principle is that of *gastric* or *digestive rest*, and the plan can be formulated perhaps in this way: *Relief can be best obtained by omitting that meal after which the most distress is generally experienced.* Of course, the most extended period of rest can be secured by omitting a meal just before or just after the night's sleep, which is nature's own period of rest, but nature's rest is, in many cases, ineffective from delayed digestion and the acrid contents of the stomach consequent on it, this acridity producing pyloric spasm and an inability on the part of the stomach, for this reason, to free itself. Gastric atony may be a factor, and gastric dilatation, but these are also relieved by the same plan. Nor is it necessary, to make the wonderful cures Dr. Keith relates, that the actual amount of food taken in 24 hours should be less, for the remaining meals may be larger and more free, and even an additional meal may be slipped in, remembering always that the prolonged rest period be left without food. Under this plan the reviewer has seen just as wonderful results, in relief, increased strength and comfort, cure of insomnia, and gain in weight, cases exactly analogous to Dr. Keith's.

There are many reasons why the omission of breakfast is not desirable. Dr. Keith is so carried away by Dr. Dewey's success that he is willing to accept the plan, but there is a feeling almost instinctive in most minds that the food of the morning is in some way useful in supporting the system for that work of the day which is almost always done in the earlier hours. We admit, however, that where gastric distress is felt peculiarly after breakfast and where the omission of the evening meal for a few days fails to relieve it, it can be tried.

Dr. Keith also has some very valuable things to say about stimulants and hot water, about cravings and dislikes, and sleeplessness, and life in hot climates, and about meat diets. At heart he is a vegetarian without confessing it, perhaps even to himself, but his leanings that way have not made him unreasonable, and he writes on all these topics in the thoroughly easy, natural, English way which we find it so hard to acquire in American professional literary work. Sure it is that no one, no matter how antagonistic, can read such a book through without gaining valuable and forcible hints in regard to the treatment of a large class of sufferers from gastric distress and its consequences.

EDWARD WILLARD WATSON.

NOTES AND NOTIONS.

A Therapeutic Pot-pourri.

Paraform pastilles may be purchased, which, by the aid of a small special apparatus, will quickly generate active formic aldehyde gas.—An aqueous glycerin extract of the lungs of sheep is used by Brunet, both by the mouth and hypodermically, in the treatment of pulmonary affections.—Sodium copaibate, from ten to twenty-five grains four, five, or six times a day, is useful in the treatment of gonorrhea, and is not so irritating to the intestinal tract and kidneys as corresponding doses of the oil of copaiba.—Boric acid is of some value for the removal of the indelible yellow stains which sometimes remain upon the skin where burns have been treated with picric acid. —When the skin has been burnt with carbolic acid, apply alcohol and wash in running water.—The virulence of scarlet fever may be mitigated by large doses of carbolic acid frequently repeated, and it is said that any person taking scarlet fever from a patient who has been under this treatment will invariably have the disease in a milder form.—For the paroxysms of angina pectoris Osler recommends nitrite of amyl in doses of from two to five minims, large doses of morphine hypodermically, and, when very severe, inhalations of chloroform.—Thymus gland, eight grains three times a day, gradually increased to from fifty to one hundred grains daily, is used in the treatment of exophthalmic goitre.—Apioline has been used successfully in neurotic dysmenorrhea.—An infusion of birch leaves acts as a diuretic.—It is said that the Röntgen rays have been used with some success for the removal of hairy, pigmented moles.—Stowell says that thyroid-gland extract is an excellent galactagogue.—Gillette has found the injection of a teaspoonful of hydrogen dioxide an efficient remedy for epistaxis.—Mariotti, after evacuating the contents of a tuberculous abscess, injects a ten-per-cent. solution of oil of cloves suspended in sterilized oils. —Chantemesse believes that the antitoxins may be injected into the rectum, after an enema, in the same doses and with as good results, as when employed hypodermically.—Bienwald has arrested the hemorrhage of a small wound on the face of an hemophilic by the application of freshly-drawn blood from a healthy woman.—Wright has had success with a solution of fibrin ferment and chloride of calcium as a styptic.

Cattell.

Baby-Farms.

Every large city has a number of foundling institutions and baby-farms, where an illegitimate child can be placed with more than an even chance that it will die before it cuts its first teeth. No more horrible condition of affairs can well be imagined than that recently revealed by an investigation of the Foundling Hospital at Naples,[1] where of 856 children admitted in two years 853 had

[1] The *Lancet*, June 12, 1897.

died, sufficient time probably not having elapsed for the decease of the three who survived. A death rate of 99.65 % is certainly a good showing, provided it be desired to get rid of the children, as seems to have been the case in this institution, where with criminal negligence every hygienic rule was broken. In this connection may be cited the history of a baby-farm which I was recently called upon to investigate in Philadelphia. An ignorant woman who had been but three weeks in the business received four new-born babes from a neighboring midwife. Three of these, or 75%, died from malnutrition, and the fourth would probably have shared the same fate but for the fact that it was only one day under the woman's care.

CATTELL.

Color Inebriety and Color Therapeusis.

THERE exists in the community a certain small percentage of persons who have no control over the color sense. While the normal individual will gaze for a moment upon gay exhibitions of color and turn away unaffected, these unfortunate perverts lose self-control and will remain dazzled and lost before any mass of colored material, either simple in color or complex, and the juxtaposition of certain colors may excite them at times to an almost dangerous frenzy. The effect of color was early discovered and used empirically, as in battle-flags, personal adornment, the pageantry of royalty and war, and gala decorations, and these and the habit of wearing black as a mourning garb show that all are in a measure susceptible to excitation by color and to consequent depression in its absence. The exhilaration of the city man let loose in park or country, the rapture of the artistic mind at blue ocean and purple hills, the ecstatic emotion produced by a gorgeous sunset, the sadness of the gray day, and the illimitable blackness of night show the same thing. Is it not possible that we have made too little study and too little use therapeutically of color and colors? There seems some reason for believing that color may have in the future a considerable field, but to avoid a false start a careful, systematic study of the mental and physical effects of different colors, in masses, upon the healthy should be made; this should be followed by a study of color on temperament and sex and on diseased and emotional conditions. It will probably be found that the female sex is more instinctively true in the recognition of its uses and the male more susceptible to its impression.

EDWARD WILLARD WATSON.

Two State Board Examinations.

Physicians who have been in active practice for a number of years can spend a few evenings to no better advantage than in attempting to write answers to the questions propounded by the various State medical examining boards. A meeting of a county medical society could profitably be devoted to answering a set of questions prepared by the president or secretary. Any

question which cannot be answered should be immediately searched for in the library of the physician, and if he find that his library is deficient in such books of reference they should be purchased. We append the lists of questions recently used by the examining boards representing the Medical Society of the State of Pennsylvania and that of North Carolina. The Pennsylvania list is as follows:

ANATOMY.—1. Describe the endocardium. 2. What muscles form the "quadriceps extensor cruris" and where is its conjoined tendon inserted? 3. With what bones does the malar articulate? 4. What arteries supply the bladder, in the male, and from what are they branches? 5. In an amputation of the forearm, three inches above the wrist, what arteries will it be necessary to tie, and of what are they branches? 6. Describe the sciatic nerve. 7. Name the ductless glands. 8. Locate the fourth ventricle of the brain. 9. Locate and briefly describe the gall bladder. 10. What are the uriniferous tubules? Describe and locate them. PHYSIOLOGY.—1. Name the groups of food stuffs constituting the source of muscular energy; designate the most important, and state what stored product is utilized. 2. State the function of the nervus opticus, and explain by description or diagram, the distribution of the fibres composing the chiasma and the effect thereof upon vision. 3. Describe the ordinary red blood corpuscle and its functions. 4. Describe the functions of the lymphatic system. 5. Describe the minute phenomena of muscular action. PATHOLOGY.—1. What blood-changes occur in chlorosis, and how differentiated from leucocythemia? 2. What structural changes are found in atheromatous arteries? 3. Describe the varieties of renal tube casts and state in what forms of kidney disease they are found. 4. Explain wherein infective inflammation differs from simple, and what the ultimate results of each type are in the parts affected. 5. Describe the common lesion of Addison's disease. THERAPEUTICS.—1. Enumerate the symptoms arising from a toxic dose of digitalis. 2. Name the therapeutic uses of apomorphia, and state how codeia differs in its physiological action from that of morphia. 3. How does belladonna differ in its physiological action from that of nitro-glycerine? 4. Describe the physiological action of salicylic acid. 5. Give the therapeutics of nitrate of silver. PRACTICE.—1. Give the cause of erysipelas and name the most usual complications. 2. Name the causes and describe the morbid anatomy and symptoms of cerebral hemorrhage. 3. Give the morbid anatomy and physical signs of acute endocarditis. 4. Mention the causes and describe the treatment of gastralgia. 5. Give the physical signs and treatment of sero-fibrinous pleurisy. SURGERY.—1. Give the symptoms and treatment of acute synovitis. 2. Name the varieties of dislocation of the knee; the special danger and modes of reduction. 3. Describe the technique of cerebral operations. 4. Detail the symptoms and treatment of a foreign body in the air-passages. 5. Name the types of wounds of the abdomen; their symptoms and treatment. 6. Stricture of urethra; name varieties, with symptoms of each and treatment of first named. 7. From what causes or in what way, may death occur during the administration of an anesthetic, and what precautions should be taken if such is threatened? 8. Give the symptoms, prognosis, and treatment of hip-joint disease (morbus coxarius). 9. Describe the method of paracentesis thoracis. 10. Describe a ligation of the tibial artery. OBSTETRICS.—1. Give the distinguishing features of the female pelvis and their importance in parturition. 2. Describe the mechanism of labor in L. O. P. position. 3. In what cases would it be necessary to perform version and what would be your manipulation? 4. What is the true function of the

forceps; in what complications would you use them, and what are the essential conditions of safety? 5. Name the causes and treatment of postpartum hemorrhage, and describe prophylaxis. 6. Mention the sources and treatment of puerperal septicemia, and give in detail, prophylaxis. 7. What anesthetic would you use in labor, in what conditions, and to what degree? 8. How would you manage a case of rigid os uteri? 9. How do you treat a face presentation, chin posterior? 10. Describe correct management of third stage of labor. MATERIA MEDICA.—1. By what rule would you determine the dose of any medicine for a child? 2. What is incompatibility in medicine, and what are the different kinds of incompatibles? Give an example of each. 3. Name ten official preparations of mercury. Name four alkaloids of opium. 4. Give the source and dose of sparteine, eserine, picrotoxin, creosote, and Pix Liquida. 5. Describe cantharis and name four official preparations. CHEMISTRY.—1. How is the hypobromite of soda solution prepared? Describe its use and chemical reaction as a test in urinary analysis. 2. State the most common and convenient antidotes for poisoning by mineral acids. State also the course to be pursued when the poison to be antidoted is unknown. 3. Name the most important inorganic salts found in normal urine. 4. How would you make Fehling's solution, and how determine if a given specimen had deteriorated? 5. What is the chemical composition of bone? DIAGNOSIS.—1. What is the significance of the patellar reflex as a sign of disease? 2. Diagnosticate acute pericarditis. 3. Differentiate epilepsy from hysteria. 4. Differentiate neuritis and rheumatism. 5. Differentiate acute phthisis and capillary bronchitis. HYGIENE.—1. What diseases are progagated by drinking water, and how can their spread be prevented? 2. Describe, in detail, the sanitary precautions necessary in typhoid fever. 3. What hygienic precautions should be employed about diphtheria? 4. Mention three satisfactory disinfectants and give indications for their use. 5. What principal hygienic directions should be given to patients suffering from tuberculosis pulmonum?

The North Carolina list:

MATERIA MEDICA AND THERAPEUTICS.—1. Give the symptoms and treatment of poisoning by gelsemium. 2. Give the symptoms and treatment of acute ergotism. 3. Give the physiological action of camphor. 4. What are the constituents of a seidlitz powder? 5. Give physiological action of alcohol. 6. What is glonoin, and give its therapy? 7. Give physiological action of phosphorus and best antidote for poison by it. 8. Of what is salol composed, and give its uses? 9. Give the physiological action of creosote and dose. 10. How would you treat a patient who had taken an overdose of water of ammonia? 11. Give the physiological action and therapy of ox-gall. 12. What are the constituents of Dover's powder? SURGERY.—1. Define (1) Phlegmon, (2) Tetanus, (3) Sapremia, (4) Spondylitis, (5) Bacillus. 2. Give the symptoms of (1) Pyemia, (2) Erysipelas, (3) Cerebral abscess of third left frontal convolution, (4) Appendicitis, (5) Carcinoma of breast. 3. Give the diagnosis of (1) Syphilis, (2) Cerebral concussion, (3) Concealed hemorrhage, (4) Synovitis of knee joint, (5) Coxalgia. 4. What is the etiology of (1) Inflammation, (2) Sapremia, (3) Gangrene, (4) Myxedema, (5) Actinomycosis, (6) Erysipelas. 5. What is the treatment of (1) Chronic abscess, (2) Fracture of femur (upper third), (3) Internal hemorrhoids, (4) Glaucoma, (5) Talipses equino-varus, (6) Shock, (7) Stricture of rectum. 6. (1) Describe the operation for fistula in ano, (2) The method of reduction of subglenoid dislocation of humerus. 7. Give temperature chart, first week, of (1) Hectic fever, (2) Septicemia, (3) Malaria. 8. Describe the operation for strangulated inguinal hernia. PHYSIOLOGY.—1. Under what two great heads

are food stuffs classed? Name article of food belonging to each class. 2. Name ferments respectively of Saliva, Gastric Juice, and Pancreatic Fluid. 3. What part does each perform in digestion? 4. What force keeps up circulation? 5. Explain how and why it is that incompetency of the Aortic Valves affects the nourishment of the heart. 6. What is the office of Red Blood Corpuscles, their size and relative proportion to White? 7. What is the nervous mechanism of respiration? 8. What is the object of respiration, and how is breathing maintained? 9. Through what nerve or nerves is the sense of taste carried to the brain? 10. What are the component parts of a complete nerve? 11. Name centres lodged in the Medulla. 12. What pathological condition is induced by a Lesion in the floor of the Fourth Ventricle? ANATOMY.—Describe (1) the External Surface of the Squamous Portion of the Temporal Bone; (2) the Ramus of the Lower Jaw; (3) the Shaft of the Femur; (4) the Inferior Extremity of the Radius. 2. Describe the Elbow Joint. 3. Describe (1) the Anterior Humeral Group of Muscles; (2) the Posterior Femoral Group of Muscles. 4. Give the relations of (1) the Anterior Tibial Artery; (2) the Brachial Artery *at the Elbow Joint;* (3) the Right Common Carotid Artery *to muscles.* 5. Describe (1) the Hypoglossal Nerve; (2) the Anterior Crural Nerve. 6. Give the relations of the stomach. 7. Describe the Internal Saphenous Vein, and its opening in the Fascia Lata. CHEMISTRY.—1. Define, *a*, Qualitative Analysis; *b*, Synthesis; *c*, a Base; *d*, a Salt. 2. Give the physical properties of Iodine, Sodium, and Mercury. 3. Give the physical and chemical properties of Carbon Monoxide and explain its actions when inspired. 4. Write the names of the substances for which the following are the symbols: KOH, HCN, $AgNO_3$, H_2SO_4, $C_6H_{10}O_5$. 5. Explain the chemical difference between Calomel and Corrosive Sublimate. 6. What is the chemical change which occurs in the fermentation of Glucose? 7. What is the chemistry of the Coagulation of Milk? 8. What is the chemistry of the Saponification of Fats? OBSTETRICS.—1. Describe the mechanism of labor in posterior rotation of the occiput, the vertex presenting. 2. What is placenta previa? *a.* How soon does it cause trouble? *b.* What are the dangers? *c.* What treatment is demanded *before* and at full term? 3. Give symptoms, cause, and treatment of Eclampsia. 4. How is the placenta formed? (1) What are its functions? (2) Does the maternal blood enter the circulation of the child? GYNECOLOGY.—5. Name the displacements of the uterus, and give the points of diagnosis between retroflection and retro-uterine fibroid. 6. Describe an efficient secondary operation for the complete rupture of the perineum. 7. Give symptoms, differential diagnosis, and treatment of pelvic hematocele. 8. How would you diagnose between cancer of the uterus and sloughing fibroid polypus. PEDIATRICS.—9. Give symptoms, with points of diagnosis between *acute dyspeptic diarrhea* and *cholera infantum*, and treatment for each. 10. What is the difference in etiology and pathology, between diphtheria and membranous croup? Give a detail of the latest and best treatment. 11. Differentiate between scarlet fever and the other exanthematous diseases. 12. Describe symptoms and treatment of chorea. PRACTICE OF MEDICINE.—1. Give the methods of physical examination of the chest. 2. Give differential diagnosis between capillary bronchitis, emphysema, and pulmonary tuberculosis. 3. The heart. Define: *a.* Diagnosis of mitral regurgitation. *b.* Aortic obstruction. *c.* Hypertrophy. *d.* Dilatation. 4. Give pathology of pachymeningitis, spinal sclerosis posterior, and acute myelitis. 5. Define: *a.* Neuritis. *b.* Neuralgia. *c.* Chorea. *d.* Epilepsy. 6. Give synonyms, definition, etiology, symptoms, diagnosis, prognosis, and treatment of simple anemia. 7. Describe the hygienic management of a case of typhoid fever. 8. What is the relation of drinking water to the production of malarial fever. 9. Define: *a.* Acute

gastritis. *b.* Enteritis. *c.* Diarrhea. *d.* Dysentery. 10. What is the etiology of gout? Differential diagnosis of rheumatism and gout, and treatment of each.

A persual of these questions shows a tendency towards demanding theoretical rather than practical knowledge for permission to practice medicine in the States of Pennsylvania and North Carolina. There is no physical examination of patients, no use of the microscope or other scientific instruments of precision, and no application of splints or bandages.

CATTELL.

Mississippi Valley Medical Association.

THE Executive Committee of the Mississippi Valley Medical Association met recently at Louisville, in conjunction with the local committee of arrangements. It was determined to make the coming meeting, which is to be held at Louisville, October 5, 6, 7 and 8, 1897, one of the largest and best in the history of the Association, and everything points to a fulfillment of this endeavor. The railroads will make a round-trip rate of one and a-third fare, or possibly one fare. The address on surgery will be delivered by Dr. J. B. Murphy, of Chicago, and that on medicine by Dr. John V. Shoemaker, of Philadelphia. Authors desiring to read papers should send the titles to Dr. H. W. Loeb, Secretary, St. Louis, Mo.

CATTELL.

Montreal Meeting of the British Medical Association.

THE sixty-seventh annual meeting of the British Medical Association will be held in Montreal, Canada, from August 31st to September 4, 1897. This is the first time in the history of the association that the place of meeting has been chosen in one of the British colonies. We hope to give a full account of the scientific proceedings in the September number of the INTERNATIONAL MEDICAL MAGAZINE.

CATTELL.

NOTE TO CONTRIBUTORS.

AUTHORS will receive liberal compensation for all accepted articles after publication; or 250 reprints, if asked for on the manuscript, will be furnished in lieu of the honorarium. It is distinctly understood that all articles appearing as original matter are for our exclusive use, and are not to be reprinted or to appear in any other publication excepting the Transactions of the Society before which the paper may have been read. Illustrated papers are especially desired.

All matters of business, as well as subscriptions, should be sent to the INTERNATIONAL MEDICAL MAGAZINE COMPANY, 3709 Spruce Street, Philadelphia.

Manuscripts, exchanges, and books for review should be addressed to the Editorial Office, 3709 Spruce Street, Philadelphia.

INTERNATIONAL
MEDICAL MAGAZINE.

Vol. VI.] SEPTEMBER, 1897. [Nos. 8 & 9.

ORIGINAL COMMUNICATIONS.

ADDRESS IN MEDICINE DELIVERED BEFORE THE BRITISH MEDICAL ASSOCIATION AT MONTREAL, SEPTEMBER 1, 1897.

BY WILLIAM OSLER, M.D., F.R.C.P.,
Professor of Medicine in the Johns Hopkins University, Baltimore, Md.

To trace successfully the evolution of any one of the learned professions would require the hand of a master—of one who, like Darwin, combined the capacity for patient observation with philosophic vision. In the case of medicine the difficulties are enormously increased by the extraordinary development which belongs to the history of the present century. The rate of progress has been too rapid for us to appreciate, and we stand bewildered and, as it were, in a state of intellectual giddiness, when we attempt to obtain a broad, comprehensive view of the subject. In a safer "middle flight" I propose to dwell on certain of the factors which have moulded the profession in English-speaking lands beyond the narrow seas —of British medicine in Greater Britain. Even for this lesser task (though my affiliations are wide and my sympathies deep) I recognize the limitations of my fitness, and am not unaware that in my ignorance I shall overlook much which might have rendered less sketchy a sketch necessarily imperfect.

Evolution advances by such slow and imperceptible degrees that to those who are part of it the finger of time scarcely seems to move. Even the great epochs are seldom apparent to the participators. During the last century neither the colonists nor the mother country appreciated the thrilling interest of the long-fought duel for the possession of this continent. The acts and scenes of the drama, to them detached, isolated, and independent, now glide like dissolving views into each other, and in the vitascope of history we can see the true sequence of events. That we can meet

here to-day, Britons on British soil, in a French province, is one of the far-off results of that struggle. This was but a prelude to the other great event of the eighteenth century, the revolt of the colonies and the founding of a second great English-speaking nation; in the words of Bishop Berkeley's prophecy, "Time's noblest offspring."

Surely a unique spectacle that a century later descendants of the actors of these two great dramas should meet in an English city in New France! Here the American may forget Yorktown in Louisburg, the Englishman Bunker Hill in Quebec, and the Frenchman both Louisburg and Quebec in Chateauguay; while we Canadians, English and French, in a forgiving spirit, overlooking your unseemly quarrels, are only too happy to welcome you to our country — this land on which and for which you have so often fought.

Once, and only once, before in the history of the world could such a gathering as this have taken place. Divided though the Greeks were, a Hellenic sentiment of extraordinary strength united them in certain assemblies and festivals. No great flight of imagination is required to picture a notable representation of our profession in the fifth century B.C., meeting in such a colonial town as Agrigentum, under the presidency of Empedocles. Delegates from the mother cities, predecessors of Hippocrates of the stamp of Damocedes and Herodicus, delegates from the sister colonies of Syracuse and other Sicilian towns, from neighboring Italy, from far-distant Massilia, and from still more distant Panticapæum and Istria. And in such an assemblage there would have been men capable of discussing problems of life and mind more brilliantly than in many subsequent periods, in proportion as the pre-Hippocratic philosophers in things medical had thought more deeply than many of those who came after them.

We English are the modern Greeks, and we alone have colonized as they did, as free peoples. There have been other great colonial empires, Phœnician, Roman, Spanish, Dutch, and French, but in civil liberty and intellectual freedom Magna Græcia and Greater Britain stand alone. The parallel so often drawn between them is of particular interest with reference to the similarity between the Greek settlements in Sicily and the English plantations on the Atlantic coast. Indeed, Freeman says, "I can never think of America without something suggesting Sicily, or of Sicily without something suggesting America." I wish to use the parallel only to emphasize two points, one of difference and one of resemblance. The Greek colonist took Greece with him. Hellas had no geographical bounds; "Massilia and Olbia were cities of Hellas in as full sense as Athens or Sparta." While the emigrant Britons changed their sky, not their character, in crossing the great sea, yet the home-stayers had never the same feeling towards the plantations as the Greeks had towards the colonial cities of Magna Græcia. If, as has been shrewdly surmised, Professor Seely was Herodotus re-incarnate, how grieved the spirit of the father of history must have been to say of Englishmen, "nor have we even now ceased to think

of ourselves as simply a race inhabiting an island off the northern coast of the continent of Europe." The assumption of gracious superiority which, unless carefully cloaked, smacks just a little of our national arrogance, is apt to jar on sensitive colonial nerves. With the expansion of the empire, and the supplanting of a national by an imperial spirit, this will become impossible. That this sentiment never prevailed in Hellas, as it did later in the Roman Empire, was due largely to the fact that in literature, in science, and in art the colonial cities of Greece early overshadowed the mother cities. It may be because the settlements of Greater Britain were things of slower growth that it took several generations and several bitter trials to teach a lesson the Greeks never had to learn.

The Greek spirit was the leaven of the old world, the workings of which no nationality could resist; thrice it saved western civilization, for it had the magic power of leading captivity captive and making even captive conquerors the missionaries of her culture. What modern medicine owes to it will appear later. "The love of science, the love of art, the love of freedom, vitally correlated to each other and brought into organic union," were the essential attributes of the Greek genius. (Butcher.) While we cannot claim for the Anglo-Saxon race all of these distinctions, it has in a high degree that one which has been the most precious gift of the race to the world—the love of freedom,

> "Of freedom in her regal seat
> Of England."

It would carry me too far afield to discuss the difference between the native Briton and his children scattered so widely up and down the earth. In Canada, South Africa, Australia, and New Zealand types of the Anglo-Saxon race are developing which will differ as much from each other, and from the English, as the American does to-day from the original stock; but amid these differences can everywhere be seen those race qualities which have made us what we are—"courage, national integrity, steady good sense, and energy in work." At a future meeting of the Association, perhaps in Australia, a professional Sir Charles Dilke with a firm grasp of the subject may deal with the medical problems of Greater Britain in a manner worthy of the address in medicine. My task, as I mentioned at the outset, is much less ambitious.

Could some one with full knowledge patiently analyze the characteristics of British medicine, he would find certain national traits sufficiently distinct for recognition. Three centuries cannot accomplish very much (and that period has only just passed since the revival of medicine in England), but the local conditions of isolation, which have been singularly favorable to the development of special peculiarities in the national character, have not been without effect in the medical profession. I cannot do more than touch upon a few features, which may be useful as indicating the sources of influences upon Great Britain in the past, and which may perhaps be suggestive as to lines of progress in the future.

Above the fireplace in Sir Henry Acland's study are three panelled portraits of Linacre, Sydenham, and Harvey; the scroll upon them reads, *Literæ*, *Praxis*, *Scientia*. To this great triumvirate, as to the fountain-heads, we may trace the streams of inspiration which have made British medicine what it is to-day.

Linacre, the type of the literary physician, must ever hold a unique place in the annals of our profession. To him was due in great measure the revival of Greek thought in the sixteenth century in England, and in the last Harveian oration Dr. Payne has pointed out his importance as a forerunner of Harvey. He made Greek methods available; through him the art of Hippocrates and the science of Galen became once more the subject of careful, first-hand study. Linacre, as Dr. Payne remarks, "was possessed from his youth till his death by the enthusiasm of learning. He was an idealist devoted to objects which the world thought of little use." Painstaking, accurate, critical, hypercritical perhaps, he remains to-day the chief literary representative of British medicine. Neither in Britain nor in Greater Britain have we maintained the place in the world of letters created for us by Linacre's noble start. It is true that in no generation since has the profession lacked a man who might stand unabashed in the temple at Delos; but, judged by the fruits of learning, scholars of his type have been more common in France and Germany. Nor is it to our credit that so little provision is made for the encouragement of these studies. For years the reputation of Great Britain in this matter was sustained almost alone by the great Dee-side scholar, the surgeon of Banchory, Francis Adams—the interpreter of Hippocrates to English students. In this century he and Greenhill have well maintained the traditions of Linacre. Their work, and that of a few of our contemporaries, among whom Ogle must be specially mentioned, has kept us in touch with the ancients. But by the neglect of the study of the humanities, which has been far too general, the profession loses a very precious quality.

While in critical scholarship and in accurate historical studies British medicine must take a second place, the influence of Linacre, exerted through the Royal College of Physicians and the old universities, has given to the humanities an important part in education, so that they have moulded a larger section of the profession than in any other country. A physician may possess the science of Harvey and the art of Sydenham, and yet there may be lacking in him those fine qualities of heart and head which count for so much in life. Pasture is not everything, and that indefinable, though well-understood, something which we know as breeding is not always an accompaniment of great professional skill. Medicine is seen at its best in men whose faculties have had the highest and most harmonious culture. The Lathams, the Watsons, the Pagets, the Jenners, and the Gairdners have influenced the profession less by their special work than by exemplifying those graces of life and refinements of heart which make up character. And the men of this stamp in Greater Britain have left

the most enduring mark—Beaumont, Bovell, and Hodder, in Toronto; Holmes, Campbell, and Howard, in this city; the Warrens, the Jacksons, the Bigelows, the Bowditches, and the Shattucks, in Boston; Bard, Hossack, Francis, Clark, and Flint, of New York; Morgan, Shippen, Redman, Rush, Coxe, the elder Wood, the elder Pepper, and the elder Mitchell, of Philadelphia—Brahmins all, in the language of the greatest Brahmin among them, Oliver Wendell Holmes—these and men like unto them have been the leaven which has raised our profession above the dead level of a business.

The *literæ humanitores*, represented by Linacre, revived Greek methods; but the faculty during the sixteenth and at the beginning of the seventeenth centuries was in a slough of ignorance and self-conceit, and not to be aroused even by Moses and the prophets in the form of Hippocrates and the fathers of medicine. In the pictures referred to, Sydenham is placed between Linacre and Harvey; but science preceded practice, and Harvey's great Lumleian lectures were delivered before Sydenham was born. Linacre has been well called, by Payne, Harvey's intellectual grandfather. "The discovery of the circulation of the blood was the climax of that movement which began a century and a half before with the revival of Greek medical classics, and especially of Galen." (Payne.) Harvey returned to Greek methods, and became the founder of modern experimental physiology and the great glory of British scientific medicine. The demonstration of the circulation of the blood remains in every detail a model research. I shall not repeat the oft-told tale of Harvey's great and enduring influence, but I must refer to one feature which until lately has been also a special characteristic of his direct successors in Great Britain. Harvey was a practitioner and a hospital physician. There are gossiping statements by Aubrey to the effect that "he fell mightily in his practice" after the publication of the "De Motu Cordis" and that his "therapeutic way" was not admired; but to these his practical success is the best answer. It is remarkable that a large proportion of all the physiological work of Great Britain has been done by men who have become successful hospital physicians or surgeons. I was much impressed by a conversation with Professor Ludwig in 1884. Speaking of the state of English physiology, he lamented the lapse of a favorite English pupil from science to practice; but, he added, "while sorry for him, I am glad for the profession in England." He held that the clinical physicians of that country had received a very positive impress from the work of their early years in physiology and the natural sciences. I was surprised at the number of names which he cited; among them I remember Bowman, Paget, Savory, and Lister. Ludwig attributed this feature in part to the independent character of the schools in England, to the absence of the university element so important in medical life in Germany, but, above all, to the practical character of the English mind, the better men preferring the active life in practice to a secluded laboratory career.

Thucydides it was who said of the Greeks that they possessed "the power of thinking before they acted, and of acting, too." The same is true in a high degree of the English race. To know what has to be done, then to do it, comprises the whole philosophy of practical life. Sydenham —*Angliæ lumen*, as he has been well called—is the model practical physician of modern times. Linacre led Harvey back to Galen, Sydenham to Hippocrates. The one took Greek science, the other not so much Greek medicine as Greek methods, particularly intellectual fearlessness and a certain knack of looking at things. Sydenham broke with authority and went to nature. It is an extraordinary fact that he could have been so emancipated from dogmas and theories of all sorts. He laid down the fundamental proposition, and acted upon it, that "all diseases should be described as objects of natural history." To do him justice we must remember, as Dr. John Brown says, "in the midst of what a mass of errors and prejudices, of theories actively mischievous, he was placed, at a time when the mania of hypothesis was at its height, and when the practical part of his art was overrun and stultified by vile and silly nostrums." Sydenham led us back to Hippocrates; I would that we could be led oftener back to Sydenham! How necessary to bear in mind what he says about the method of the study of medicine. "In writing, therefore, such a natural history of diseases, every merely philosophical hypothesis should be set aside, and the manifest and natural phenomena, however minute, should be noted with the utmost exactness. The usefulness of this procedure cannot be overrated easily, as compared with the subtle inquiries and trifling notions of modern writers, for can there be a shorter or indeed any other way of coming at the morbific causes or discovering the curative indications than by a certain perception of the peculiar symptoms? By these steps and helps it was that the father of physic, the great Hippocrates, came to excel, his theory being no more than an exact description or view of nature. He found that nature alone often terminates diseases, and works a cure with a few simple medicines and often enough with no medicines at all." Well indeed has a recent writer remarked, "Sydenham is unlike every previous teacher of the principles and practice of medicine in the modern world." He, not Linacre or Harvey, is the model British physician in whom were concentrated all those practical instincts upon which we lay such stress in the Anglo-Saxon character.

The Greek faculty which we possess of thinking and acting has enabled us, in spite of many disadvantages, to take the lion's share in the great practical advances in medicine. Three among the greatest scientific movements of the century have come from Germany and France. Bichât, Laennec, and Louis laid the foundation of modern clinical medicine; Virchow and his pupils, of scientific pathology; while Pasteur and Koch have revolutionized the study of the causes of disease; and yet the modern history of the art of medicine could almost be written in its fulness from the records of the Anglo-Saxon race. We can claim every practical advance

of the very first rank—vaccination, anesthesia, preventive medicine, and antiseptic surgery, the "captain jewels in the carcanet" of the profession, beside which can be placed no others of equal lustre.

One other lesson of Sydenham's life needs careful conning. The English Hippocrates, as I said, broke with authority. His motto was

> "Thou Nature art my goddess; to thy law
> My services are bound."

Undue reverence for authority as such, a serene satisfaction with the *status quo*, and a fatuous objection to change have often retarded the progress of medicine. In every generation, in every country, there have been, and ever will be, *laudatores temporis acti*, in the bad sense of that phrase, not a few of them men in high places, who have lent the weight of a complacent conservatism to bolster up an ineffectual attempt to stay the progress of new ideas. Every innovator, from Harvey to Lister, has been made to feel its force. The recently issued life of Thomas Wakley is a running commentary on this spirit, against the pricks of which he kicked so hard and so effectually. But there are signs of a great change. The old universities and the colleges, once the chief offenders, have been emancipated, and remain no longer, as Gibbon found them, steeped in port and prejudice. The value of authority *per se* has lessened enormously, and we of Greater Britain have perhaps suffered as the pendulum has swung to the other extreme. Practice loves authority, as announced in "the general and perpetual voice of men." Science must ever hold with Epicharmus that a judicious distrust and wise scepticism are the sinews of the understanding. And yet the very foundations of belief in almost everything relating to our art rest upon authority. The practitioner cannot always be the judge; the responsibility must often rest with the teachers and investigators, who can only learn in the lessons of history the terrible significance of the word. The fetters of a thousand years in the treatment of fever were shattered by Sydenham, shattered only to be riveted anew. How hard was the battle in this century against the entrenched and stubborn foe! Listen to the eloquent pleadings of Stokes, pleading as did Sydenham, against authority, and against the bleedings, the purgings, and the sweatings of fifty years ago. "Though his hair be gray and his authority high, he is but a child in knowledge and his reputation an error. On a level with a child, so far as correct appreciation of the great truths of medicine is concerned, he is very different in other respects: his powers of doing mischief are greater; he is far more dangerous. Oh, that men would stoop to learn, or at least cease to destroy!" The potency of human authority among the powers that be was never better drawn than by the judicious Hooker in his section on this subject. "And this not only with 'the simpler sort,' but the learneder and wiser we are the more such arguments in some cases prevail with us. The reason why the simpler sort are moved with authority is the conscience of their own ignorance; whereby it

cometh to pass that, having learned men in admiration, they rather feared to dislike them than know wherefore they should allow and follow their judgments. Contrariwise with them that are skilful authority is much more strong and forcible; because they only are able to discern how just cause there is why to some men's authority so much should be attributed. For which cause the name of Hippocrates (no doubt) were more effectual to persuade even such men as Galen himself than to move a silly empiric."[1]

Sydenham was called "a man of many doubts," and therein lay the secret of his great strength.

Passing now to the main question of the development of British medicine in Greater Britain, I must at once acknowledge the impossibility of doing justice to it. I can only indicate a few points of importance, and I must confine my remarks chiefly to the American part of Greater Britain. We may recognize three distinct periods corresponding to three distinct waves of influence, the first from the early immigration to about 1820, the second from about 1820 to 1860, and the third from about 1860 to the present time.

The colonial settlements were contemporaneous with the revival of medicine in England. Fellow-students of Harvey at Cambridge might have sailed in the Mayflower and the Arbella. The more carefully planned expeditions usually enlisted the services of a well-trained physician, and the early records, particularly those of the New England colonies, contain many interesting references to these college-bred men. Giles Firman, who settled in Boston in 1632, a Cambridge man, seems to have been the first to give instruction in medicine in the new world. The parsons of that day had often a smattering of physic, and illustrated what Cotton Mather called an "angelical conjunction." He says, "Ever since the days of Luke, the Evangelist, skill in *Physick* has been frequently professed and practised by Persons whose more declared Business was the study of Divinity." Firman himself, finding physic "but a meane helpe," took orders. The English physicians in the New England colonies were scholarly, able men. Roger Chillingworth, in Hawthorne's "Scarlet Letter," has depicted them in a sketch of his own life: "Made up of earnest, studious, thoughtful, quiet years, bestowed faithfully for the increase of knowledge, faithfully, too, for the advancement of human welfare—men thoughtful for others, caring little for themselves, kind, just, true, and of constant if not warm affections"—a singularly truthful picture of the old colonial physician.

Until the establishment of medical schools—University of Pennsylvania, 1763; King's College (afterwards Columbia), 1767; Harvard, 1782—the supply of physicians for the colonies came from Great Britain, supplemented by men trained under the old apprentice system, and of colonists who went to Edinburgh, Leyden, and London for their medical education. This latter group had a most powerful effect in moulding professional life in the pre-revolutionary period. They were men who had enjoyed not alone

[1] Ecclesiastical Polity, Book ii., vii. 2.

the instruction but often the intimate friendship of the great English and European physicians. Morgan, Rush, Shippen, Bard, Wistar, Hossack, and others had received an education comprising all that was best in the period, and had acquired the added culture which can only come from travel and acquaintance with the world. Morgan, the founder of the medical school of the University of Pennsylvania, was away seven years, and before returning had taken his seat as a corresponding member of the French Academy of Surgery, besides having been elected a Fellow of the Royal Society. The War of Independence interrupted temporarily the stream of students, but not the friendship which existed between Cullen and Fothergill and their old pupils in America. The correspondence of these two warm friends of the colonies testified to the strong professional intimacy which existed at the time between the leaders of the profession in the old and new worlds.

But neither Boerhaave, Cullen, nor Fothergill stamped colonial medicine as did the great Scotchman, John Hunter. Long, weary centuries separated Harvey from Galen; not a century elapsed from the death of the great physiologist to the advent of the man in whose phenomenal personality may be seen all the distinctive traits of modern medicine, and the range of whose mighty intellect has had few, if any, equals since Aristotle. Hunter's influence on the profession of this continent, so deep and enduring, was exerted in three ways. In the first place, his career as an army surgeon and his writings on subjects of special interest to military men carried his work and ways into innumerable campaigns in the long French wars and in the War of Independence. Hunter's works were reprinted in America as early as 1791 and 1793. In the second place, Hunter had a number of most distinguished students from the colonies, among whom were two who became teachers of wide reputation. William Shippen, the first professor of anatomy in the University of Pennsylvania, lived with Hunter on terms of the greatest intimacy. He brought back his methods of teaching and some measure of his spirit. With the exception of Hewson and Home, Hunter had no more distinguished pupil than Philip Syng Physick, who was his house surgeon at St. George's Hospital, and his devoted friend. For more than a generation Physick had no surgical compeer in America, and enjoyed a reputation equalled by no one save Rush. He taught Hunterian methods in the largest medical school in the country, and the work of his nephew (Dorsey) on Surgery is very largely Hunter modified by Physick. But in a third and much more potent way the great master influenced the profession of this continent. Hunter was a naturalist to whom pathological processes were only a small part of a stupendous whole, governed by law, but which could never be understood until the facts had been accumulated, tabulated, and systematized. By his example, by his prodigious industry, and by his suggestive experiments he led men again into the old paths of Aristotle, Galen, and Harvey. He made all thinking physicians naturalists, and he lent a dig-

nity to the study of organic life and re-established a close union between medicine and the natural sciences. Both in Britain and Greater Britain he laid the foundation of the great collections and museums, particularly those connected with the medical schools. The Wistar-Horner and the Warren museums originated with men who had been greatly influenced by Hunter. He was, moreover, the intellectual father of that interesting group of men on this side of the Atlantic who, while practising as physicians, devoted much time and labor to the study of natural history. In the latter part of the last century and during the first thirty years of this, the successful practitioner was very often a naturalist. I wish that time permitted me to do justice to the long list of men who have been devoted naturalists and who have made contributions of great value. Benjamin Smith Barton, David Hossack, Jacob Bigelow, Richard Harlan, John D. Godman, Samuel George Morton, John Collins Warren, Samuel L. Mitchell, J. Aitken Meigs, and many others have left the records of their industry in their valuable works and in the Transactions of the various societies and academies. In Canada many of our best naturalists have been physicians, and collections in this city testify to the industry of Holmes and McCullough.

I was regretting the *humanities* a few minutes ago, and now I have to mourn the almost complete severance of medicine from the old natural history. To a man the most delightful recollections of whose student life are the Saturdays spent with the preceptor who had a Hunterian appetite for specimens—anything from a trilobite to an acarus—to such an one across the present brilliant outlook comes the shadow of the thought that the condition of progress will make impossible again such careers as those of William Kitchen Parker and William Carmichael McIntosh.

Until about 1820 the English profession of this continent knew little else than British medicine. After this date in the United States the ties of professional union with the old country became relaxed, owing in great part to the increase in the number of home schools, and in part to the development of American literature. To 1820 one hundred and fourteen native medical books of all kinds had been issued from the press, and one hundred and thirty-one reprints and translations, the former English, the latter few in number and almost exclusively French. (Billings.)

Turning for a few minutes to the condition of the profession in Canada during this period, I regret that I cannot speak of the many interesting questions relating to the French colonies. With the earliest settlers physicians had come, and among the Jesuits, in their devoted missions, there are records of *donnés* (laymen attached to the service) who were members of the profession. One of these, René Goupil, suffered martyrdom at the hands of the Iroquois.[1]

Between the fall of Quebec in 1759 and 1820, the English population had increased by the settlement of Upper Canada, chiefly by United Em-

[1] Parkman, "Jesuits in North America."

pire Loyalists from the United States, and after the War of 1812 by settlers from the old country. The physicians in the sparsely settled districts were either young men who sought their fortunes in the new colony or were army surgeons who had remained after the Revolutionary War or the War of 1812. The military element gave for some years a very distinctive stamp to the profession. These surgeons were men of energy and ability who had seen much service, and were accustomed to order, discipline, and regulations. Sabine, in his "History of the Loyalists," refers to the Tory proclivities of the doctors, but says that they were not so much disturbed as the lawyers and clergymen. Still a good many of them left their homes for conscience' sake, and Canniff, in his "History of the Profession in Upper Canada," gives a list of those known to have been among the United Empire Loyalists.

The character of the men who controlled the profession of the new colony is well shown by the proceedings of the medical board which was organized in 1819. Drs. Macaulay and Widmer, both army surgeons, were the chief members. The latter, who has well been termed the father of the profession in Upper Canada, a man of the very highest character, did more than any one else to promote the progress of the profession; and throughout his long career his efforts were always directed in the proper channels. On looking through Canniff's most valuable work, one is much impressed by the sterling worth and mettle of these old army surgeons who in the early days formed the larger part of the profession. The minutes of the medical board indicate with what military discipline the candidates were examined, and the percentage of rejections has probably never been higher in the history of the province than it was in the first twenty years of the existence of the board.

One picture on the canvas of those early days lingers in the memory, illustrating all the most attractive features of a race which has done much to make this country what it is to-day. Widmer was the type of the dignified old army surgeon, scrupulously punctilious and in every detail regardful of the proprieties of life. "Tiger" Dunlop may be taken as the very incarnation of that restless roving spirit which has driven the Scotch broadcast upon the world. After fighting with the Connaught Rangers in the War of 1812, campaigning in India, clearing the Sangur of Tigers,—hence his sobriquet "Tiger,"—lecturing on medical jurisprudence in Edinburgh, writing for Blackwood, editing the *British Press* and the *Telescope*, introducing Beck's "Medical Jurisprudence" to English readers, and figuring as director and promoter of various companies, this extraordinary character appears in the young colony as "Warden of the Black Forest" in the employ of the Canada Company. His life in the backwoods at Gairbraid, his "Noctes Ambrosianæ Canadensis," his famous "Twelve Apostles," as he called his mahogany liquor-stand (each bottle a full quart), his active political life, his remarkable household, his many eccentricities—are they not all portrayed to the life in the recently issued "In the Days of the Canada Company"?

Turning now to the second period, we may remark in passing that the nineteenth century did not open very auspiciously for British medicine. Hunter had left no successor, and powerful as had been his influence it was too weak to stem the tide of abstract speculation with which Cullen, Brown, and others flooded the profession. No more sterile period exists than the early decades of this century. Willan (a great naturalist in skin-diseases) with a few others saved it from utter oblivion. The methods of Hippocrates, of Sydenham, and of Hunter had not yet been made available in every-day work.

The awakening came in France, and such an awakening! It can be compared with nothing but the renaissance in the sixteenth and seventeenth centuries, which gave us Vesalius and Harvey. "Citizens" Bichât and Broussais led the way, but Laennec really created clinical medicine as we know it to-day. The discovery of auscultation was only an incident, of vast moment it is true, in a systematic study of the correlation of symptoms with anatomical changes. Louis, Andral, and Chomel extended the reputation of the French school, which was maintained to the full until the sixth decade, when the brilliant Trousseau ended for a time a long line of Paris teachers whose audience had been world-wide. The revival of medicine in Great Britain was directly due to the French. Bright and Addison, Graves and Stokes, Forbes and Marshall Hall, Latham and Bennett were profoundly affected by the new movement. In the United States Anglican influence did not wane until after 1820. Translations of the works of Bichât appeared as early as 1802, and there were reprints in subsequent years, but it was not until 1823 that the first translation (a reprint of Forbes's edition) of Laennec was issued. Broussais's works became very popular in translations after 1830, and in the journals from this time on the change of allegiance became very evident. But men rather than books diverted the trend of professional thought. After 1825 American students no longer went to Edinburgh and London, but to Paris, and we can say that between 1830 and 1860 every teacher and writer of note passed under the Gallic yoke. The translations of Louis's works and the extraordinary success of his American pupils, a band of the ablest young men the country had ever seen, added force to the movement. And yet this was a period in which American medical literature was made up largely of pirated English books, and the systems, encyclopedias, and libraries, chiefly reprints, testify to the zeal of the publishers. Stokes, Graves, Watson, Todd, Bennett, and Williams furnished Anglican pap to the sucklings, as well as strong meat to the full-grown. In spite of the powerful French influence, the text-books of the schools were almost exclusively English.

In Canada the period from 1820 to 1860 saw the establishment of the English universities and medical schools. In Montreal the agencies at work were wholly Scotch. The McGill Medical School was organized by Scotchmen, and from its inception has followed closely Edinburgh meth-

ods. The Paris influence, less personal, was exerted chiefly through English and French channels. The Upper Canada schools were organized by men with English affiliations, and the traditions of Guy's, St. Bartholomew's, St. Thomas's, St. George's, and the London Hospital, rather than those of Edinburgh, have prevailed in Toronto and Kingston.

The local French influence on British medicine in Canada has been very slight. In the early decades of the century, when the cities were smaller and the intercourse between the French and English somewhat closer, the reciprocal action was more marked. At that period English methods became somewhat the vogue among the French; several very prominent French Canadians were Edinburgh graduates. Attempts were made in the medical journals to have communications in both languages, but the fusion of the two sections of the profession was no more feasible than the fusion of the two nationalities, and the development has progressed along separate lines.

The third period dates from about 1860, when the influence of German medicine began to be felt. The rise of the Vienna school was for a long time the only visible result in Germany of the French renaissance. Skoda, the German Laennec, and Rokitansky, the German Morgagni, influenced English and American thought between 1840 and 1860, but it was not until after the last date that Teutonic medicine began to be felt as a vitalizing power, chiefly through the energy of Virchow. After the translation of the "Cellular Pathology" by Chance (1860) the way lay clear and open to every young student who desired inspiration. There had been great men in Berlin before Virchow, but he made the town on the Spree a Mecca for the faithful of all lands. From this period we can date the rise of German influence on the profession of this continent. It came partly through the study of pathological histology, under the stimulus given by Virchow, and partly through the development of the specialities, particularly diseases of the eye, of the skin, and of the larynx. The singularly attractive courses of Hebra, the organization on a large scale in Vienna of a system of graduate teaching designed especially for foreigners, and the remarkable expansion of the German laboratories combined to divert the stream of students from France. The change of allegiance was a deserved tribute to the splendid organization of the German universities, to the untiring zeal and energy of their professors, and to their single-minded devotion to science for its own sake.

In certain aspects the Australasian settlements present the most interesting problems of Greater Britain. More homogeneous, thoroughly British, isolated, distant, they must work out their destiny with a less stringent environment than, for example, surrounds the English in Canada. The traditions are more uniform, and of whatever character have filtered through British channels. The professional population of native-trained men is as yet small, and the proportion of graduates and licentiates from the English, Scotch, and Irish colleges and boards guarantees a dominance

of Old Country ideas. What the maturity will show cannot be predicted, but the vigorous infancy is full of crescent promise. On looking over the files of Australian and New Zealand journals, one is impressed with the monotonous similarity of the diseases in the antipodes to those of Great Britain and of this continent. Except in the matter of parasitic affections and snake-bites, the nosology presents few distinctive qualities. The Proceedings of the four Intercolonial Congresses indicate a high level of professional thought. In two points Australia has not progressed as other parts of Greater Britain. The satisfactory regulation of practice, so early settled in Canada, has been beset with many difficulties. Both in the United States and in Australia the absence of the military element, which was so strong in Canada, may in part at least account for the great difference which has prevailed in this matter of the state license. The other relates to the question of ethics, to which one really does not care to refer, were it not absolutely forced upon the attention in reading the journals. Elsewhere professional squabbles, always so unseemly and distressing, are happily becoming very rare, and in Great Britain, and on this side of the water, we try at any rate "to wash our dirty linen at home." In the large Australian cities, differences and dissensions seem lamentably common. Surely they must be fomented by the atrocious system of elections to the hospitals, which plunges the entire profession every third or fourth year into the throes of a contest in which the candidates have to solicit the suffrages of from 2000 to 4000 voters! Well, indeed, might Dr. Batchelor say, in his address at the fourth Intercolonial Congress, "It is a scandal that in any British community, much less in a community which takes pride in a progressive spirit, such a pernicious system should survive for an hour."

Of India, of "Vishnu-land," what can one say in a few minutes? Three thoughts at once claim recognition. Here in the dim dawn of history, with the great Aryan people, was the intellectual cradle of the world. To the Hindoos we owe a debt which we can at any rate acknowledge; and even in medicine many of our traditions and practices may be traced to them, as may be gathered from that most interesting "History of Aryan Medical Science," by the Thakore Sahib of Gondal.

Quickly there arises the memory of the men who have done so much for British medicine in that great empire. Far from their homes, far from congenial surroundings, and far from the stimulus of scientific influences, Annesley, Ballingall, Twining, Morehead, Waring, Parkes, Cunningham, Lewis, Vandyke Carter, and many others, have upheld the traditions of Harvey and of Sydenham. On the great epidemic diseases how impoverished would our literature be in the absence of their contributions! But then there comes the thought of "the petty done, the vast undone," when one considers the remarkable opportunities for study which India has presented. Where else in the world is there such a field for observation in cholera, leprosy, dysentery, the plague, typhoid fever, malaria, and a host of other less important maladies? And what has the British govern-

ment done towards the scientific investigation of the diseases of India? Until recently little or nothing, and the proposal to found an institute for the scientific study of disease has actually come from the native chiefs! The work of Dr. Hankin and Professor Haffkine, and the not unmixed evil of the brisk epidemic of plague in Bombay, may arouse the officials to a consciousness of their shortcomings. While sanitary progress has been great, as shown in a reduction of the mortality from 69 per mille before 1857 to 15 per mille at present, many problems are still urgent, as may be gathered from reading Dr. Harvey's Presidential Address and the "Proceedings of the Indian Medical Congress." That typhoid fever can be called the "scourge of India" and that the incidence of the disease should remain so high among the troops point to serious sanitary defects as yet unremedied. As to the prevalence of the venereal disease among the soldiers an admission of 500 per mille tells its own tale.

On reading the journals and discussions one gets the impression that matters are not as they should be in India. There seems to be an absence of proper standards of authority. Had there been in each presidency during the past twenty years thoroughly equipped government laboratories in charge of able men, well trained in modern methods, the contributions to our knowledge of epidemic diseases might have been epoch-making, and we should have been spared the crudeness which is evident in the work (particularly in that upon malaria) of some zealous but badly trained men.

In estimating the progress of medicine in the countries comprising Greater Britain, the future rather than the present should be in our minds. The strides which have been taken during the past twenty years are a strong warrant that we have entered upon a period of exceptional development. When I see what has been accomplished in this city in the short space of time since I left, I can scarcely credit my eyes; the reality exceeds the utmost desire of my dreams. The awakening of the profession in the United States to a consciousness of its responsibilities and opportunities has caused unparalleled changes, which have given an impetus to medical education and to higher lines of medical work which has already borne a rich harvest. Within two hundred years who can say where the intellectual centre of the Anglo-Saxon race will be? The mother country herself has only become an intellectual nation of the first rank within a period altogether too short to justify a prediction that she has reached the zenith. She will probably reverse the history of Hellas, in which the mental superiority was at first with the colonies. At the end of the next century, ardent old-world students may come to this side "as o'er a brook," seeking inspiration from great masters, perhaps in this very city; or the current may turn towards the schools of the great nations of the south. Under new and previously unknown conditions, the Africander, the Australian, or the New Zealander may reach a development before which even "the glory that was Greece" may pale. Visionary as this may appear, it is not one whit more improbable to-day than would have been a

prophecy made in 1797 that such a gathering as the present would be possible within a century on the banks of the St. Lawrence.

Meanwhile, to the throbbing vitality of modern medicine the two great meetings held this month, in lands so widely distant, bear eloquent testimony. Free, cosmopolitan, no longer hampered by the dogmas of schools, we may feel a just pride in a profession almost totally emancipated from the bondage of error and prejudice. Distinctions of race, nationality, color, and creed are unknown within the portals of the temple of Æsculapius. Dare we dream that this harmony and cohesion so rapidly developing in medicine, obliterating the strongest lines of division, knowing no tie of loyalty but loyalty to truth—dare we hope, I say, that in the wider range of human affairs a similar solidarity might ultimately be reached? Who can say that the forges of Time will weld no links between man and man stronger than those of religion or of country? Some Son of Beor, touched with prophetic vision, piercing the clouds which now veil the eternal sunshine of the mountain-top—some spectator of all time and all existence (to use Plato's expression)—might see in this gathering of men of one blood and one tongue a gleam of hope for the future, of hope at least that the great race so dominant on the earth to-day may progress in the bonds of peace—a faint glimmer perhaps of the larger hope of humanity, of that day when "the common sense of most shall hold a fretful 'world' in awe." There remains for us, Greater Britons of whatsoever land, the bounden duty to cherish the best traditions of our fathers, and particularly of the men who gave to British medicine its most distinctive features, of the men, too, who found for us the light and liberty of Greek thought—Linacre, Harvey, and Sydenham, "those ancient founts of inspiration" and models for all time in literature, science, and practice.

CANADA, ITS MEDICAL LIFE AND RESOURCES.[1]

BY T. G. RODDICK, M.D.,

Professor of Surgery in McGill University, Montreal.

Climatic Conditions.—As it may be presumed that to many of those present here to-day Canada is almost an unknown country, I have thought that among one or two other subjects a few remarks on the atmospheric conditions and health resorts of the Dominion would not be without interest.

The best way to understand the atmospheric conditions of a country is first to understand its physical features. The physical features of Canada

[1] Dr. Roddick opened his Presidential address by welcoming Canada's guests, and then gave a brief historical account of the British Medical Association. The address closed with an outline of medical education and medical legislation in Canada.—EDITOR.

are very remarkable. Broadly speaking the country is separable by climatic and physical conditions into three great regions, the Eastern, Central, and Western Regions, which approximately run north and south in the general trend of the continent. The Eastern Region, which includes the older provinces of the Dominion, Ontario, Quebec, Nova Scotia, New Brunswick, and Prince Edward Island, besides the great fur territory stretching far to the east and northeast of James' Bay, extends from the Atlantic to Lake Superior and the chain of Great Lakes running in a northerly direction from Lake Superior to the Arctic Ocean. Between this great chain of lakes and the eastern base of the Rocky Mountains is the immense interior continental plain which constitutes the Central Region of Canada, its southern part consisting of open prairie, its northern part of forest lands. The third part of the division, the Western Region, is naturally well defined, consisting of the wide and wild mountainous border of the continent on the Pacific side—the Rocky, Selkirk, and Gold Ranges, which form the great Cordilleran belt, whose average width in Canada is 400 miles.

Eastern Canada, our first and largest region, is geologically of very ancient origin. Here geologists have placed the nucleus of the continent —the broad belt of crystalline rock of great antiquity called the Laurentian Plateau. This region is remarkable for its immense number of lakes large and small, and for its irregular and winding rivers with numerous rapids and falls. Between the Laurentian Plateau on the north and the Appalachian mountain system on the south, lies the great Valley of the River St. Lawrence. The basin of this majestic river covers 530,000 square miles, of which 460,000 are in Canada. Above the city of Quebec, the base of the Laurentian highlands and the ridges of the Appalachian system diverge, and the mighty river flows through an extensive low country of notable fertility, in earlier days the great granary of Canada.

It may be added *en passant* that Mount Royal, which gives such distinction and character to our city, represents the basal remnants of a volcanic vent of great antiquity. From its picturesque summit may be seen similar abrupt elevations far off towards the east and south—Montarville, Belœil or St. Hilaire, Mt. Rougemont, with Mt. Yamaska behind it, Mt. Shefford, and the conical Mt. Johnson or Monnoir. The Adirondacks are visible in the distance to the southwest, and the Green Mountains to the southeast.

Included in the Eastern Region is one of the most remarkable geographical features of Canada—the great fresh-water lakes or inland seas, Superior, Huron, Erie, and Ontario, which form the perennial reservoirs of the St. Lawrence. Together with Lake Michigan, which is wholly in the United States, they have an aggregate area of 94,750 square miles, an area larger than that of Great Britain. They stand at four distinct levels above the sea—Ontario 247 feet, Erie 573, Huron 581, and Superior 602. The Niagara Falls, the greatest and most impressive of the natural wonders

of our continent, are the direct result of the great height of Lake Erie above Lake Ontario, the river connecting the lakes being only a few miles long. Besides the St. Lawrence, Eastern Canada has several other great rivers, notably the Ottawa, which has a course of 800 miles and a basin of nearly 100,000 square miles, the St. Maurice, the Saguenay, and the St. John, the glory of New Brunswick, which, together with the Atlantic Slope, has a basin of 50,214 square miles. The Central and Western Regions also have their abundant share of large and small lakes and great rivers, an account of which would fill reams of paper. It should be noted that the Canadian rivers and lakes collectively cover an area of 130,000 square miles, and contain one-half the fresh water on the globe.

I draw special attention to this series of vast lakes and rivers because it exerts an immense and beneficent influence on the climate of Canada. It preserves the mean temperature while the land experiences the extremes. In summer the water is cooler and in winter warmer than the land, conditions which tend to modify the differences, and to favor uniformity of climate. Without these waters, too, we should have vast regions of comparatively little value, as in Africa, Asia, and in the United States west of the Mississippi River, where large tracts of land far from water are nothing more than arid wastes. Our climate is more uniform than that of Europe; the meteorological differences are produced by position alone, but Europe has a higher mean temperature, and the extremes there are not so marked or so wide apart as in Canada. Owing to the great area of Canada, extending over 20° of latitude, or from the latitude of Constantinople to that of the North Cape in Norway, the range of temperature is naturally very wide. The southern boundary stretches over fully 4000 miles, along which line we find that Southern Ontario has the latitude of Central Italy, Nova Scotia that of Northern Italy, Manitoba and Vancouver that of Central Germany. Speaking generally, the Canadian summer may be stated at 60° F. to 70° F.

From its vast and varied extent, Canada may be said to be the possessor of several climates. Taking Solly's classification as to position, we have in Canada all the three land climates, the low, the medium, and the high. The first has an elevation up to 2500 feet, the second up to 4500, and the third from 4500 upward. As to temperature and humidity, Canada comes under the category of "cold, moderate, and dry."

Health Resorts.—In the Eastern Region of the Dominion there are at least two localities which have been proved to possess many of the qualities which constitute a climate for convalescents from fevers and other depressing diseases, and also consumption in the incipient stage. I refer to the region in the Province of Quebec among the Laurentians, north of this city, of which the village of Ste. Agathe is the centre; the other being the Muskoka District in Ontario.

The first has been called the Adirondacks of Canada, having many of the features, physical and climatic, of that now celebrated plateau, situated

in the northeastern part of New York State, and stretching from the Mohawk Valley in the south 150 miles north, almost to the frontier line. The average elevation of the two regions is about the same, being from 1600 to 1800 feet. The immense pine forests, together with the moderate temperature, constitute the chief characteristics of the Canadian district, from the medical point of view. No very systematic meteorological observations have yet been taken of the Ste. Agathe region, but the indications will probably prove to be very similar so those of the American resort. It is in contemplation to erect a sanitarium on Trembling Mountain, overlooking the village of Ste. Agathe, which will doubtless in time rival the Adirondack Cottage Sanitarium near Saranac Lake Village, which has proved such a marked success under the able management of Dr. E. L. Trudeau. The elevation of the sanitarium will be 2500 feet, thus having an altitude of nearly 700 feet greater than the establishment at Saranac. It is the intention of the Quebec Government to set apart a sufficient portion of the Crown Lands to form a natural park in that part of the Province. It will be called the Trembling Mountain Park, and will cover an area of 100,000 acres of land, in which are several beautiful lakes. Within the boundaries of this park the sanitarium will be constructed. There is therefore no reason to doubt that we shall shortly have within our own lines a health resort possessing all the advantages of the Adirondacks region, and capable of affecting for good the same class of patients now so decidedly benefited by a residence in those mountains.

One hundred miles north of Toronto, in the highlands of Ontario, is the Muskoka Lake region, an area of about 10,000 square miles, perhaps the most picturesque portion of the whole Province. Within this district, which has a mean altitude above the sea of about 800 feet (200 feet above Lake Huron), there are nearly a thousand lakes and ponds, connected by innumerable streams. The chief lakes are Muskoka, Rosseau, and Joseph. These contain about 400 islands. It is a region abounding in pine forests ; the climate is dry, and the air pure and invigorating. The Muskoka region has been found undoubtedly to possess remarkable climatic advantages for those with phthisical tendencies. The death-rate from phthisis in this section of Ontario is proved to be less than one-tenth the rate which obtains in other parts of the Province. At Gravenhurst the Muskoka Cottage Sanitarium for the cure of incipient phthisis has recently been founded, under the best auspices, with accommodations for forty patients. The present sanitarium consists of a large and well-planned main building, surrounded within easy distance by a number of small cottages. The grounds, which embrace seventy-five acres, are situated on Lake Muskoka. Pine forests and rocky ridges protect the buildings on the north and west sides, whence come the colder winds in winter. Like the Adirondack Sanitarium, the intention is to occupy it all the year round. The progress of this institution, at present in the experimental stage, will be watched with much interest.

In the Central Region of Canada, that section of the Northwest Territories known as Southern Alberta—the home of the cowboy—has much to recommend it as a health resort. This strip of prairie and hill country is bounded on the north by the Canadian Pacific Railway, and on the south by the international boundary line; its eastern boundary extends as far as Medicine Hat, its western boundary to the summit line of the Rockies and British Columbia, comprising in all an area of about 20,000 square miles. The plain here has an elevation above sea-level of 2700 feet, which gradually increases up to the entrance of the Crow's Nest Pass, where the elevation is 4500 feet. Calgary, the capital of Alberta, is itself 3500 feet above sea-level. With this gradual incline from a low to a high level altitude the patient can choose the locality which suits his particular case. In a long experience Kennedy knew of only two cases of phthisis originating in that country—one of acute tuberculosis with a strong hereditary taint, which proved fatal; the other, of the ordinary type, recovered without leaving the place. He claims for the climate of Southern Alberta a dry aseptic atmosphere and a dry soil, the greatest possible number of sunshiny days (90 per cent.), with cool nights. Patients can live there all the year round, and with the exception of an occasional snowstorm, which may cover the prairie to a varying depth, nothing need interfere with their practically living in the saddle. The so-called Chinook wind has a remarkable influence over all this western section of Canada. It is a warm wind which blows with varying intensity from west to southwest. McCaul, who describes it very graphically, speaks of its approach being heralded by the massing of dark clouds above the mountain-tops and a distinct wailing and rumbling from the passes and gorges. Its effect in winter is little short of miraculous. When the real Chinook blows the temperature often rises in a few hours from 20° below to 40° above zero. The snow, which in the morning may have been a foot deep, disappears, and before night everything is dripping. But in the space of a single day all the water is lapped up by the thirsty wind, and the prairie is so dry that a horse's hoof hardly makes an impression.

The cases which have been most especially benefited by Alberta's climate are pulmonary tuberculosis in the earliest stage, although neurasthenics and anemic women are likewise favorably affected to a marked degree. It is well known that delicate lads sent from the British Isles to this section of the Northwest to work on the cattle ranches become in a year or two healthy and vigorous men, and are scarcely recognized on their return.

Still farther west, and nearly midway between Calgary and the Pacific Coast, is the beautiful Valley of Kamloops, another all-the-year-round resort, which has much to commend it to those suffering from many forms of tuberculous disease. This picturesque valley, which lies between the Rocky Mountains and the Cascade Range, has a low altitude climate of 1100 feet, but is exceedingly dry, showing an annual rainfall of only

11.05 inches, with an average of about 75 days' rain in the year. The rain soon disappears, the soil being light and gravelly. In this region we have an illustration of the local variability of climate recently pointed out by Bryce, who, in referring to the two not very distant localities of Vancouver and Kamloops, showed that, whereas the former has an annual rainfall of 35 inches, the latter records but 11 inches and a decimal. The mean annual temperature of the Valley of Kamloops is 46.03° F., the annual range being only 22.8°. The tuberculous patients who appear to be most benefited by a residence in Kamloops are those in whom there is a tendency to chronic congestion. Cases of bronchitis are likewise said to do well there. The climate can also be recommended for consumptives in whom cardiac disease exists as a complication.

The Effect of the Canadian Climate on European Races.—That Canada is an exceptionally healthful country is the general testimony of the army and navy surgeons who have been stationed in Canada with the different regiments from the time of the conquest to the present day. Crawford, who was attached to one of the regiments stationed in Montreal many years ago, and who subsequently left the army and practised in this city, published elaborate and carefully collected statistics to prove that few portions of the British Empire have a climate equal to that of Canada. In fact, his statistics prove conclusively that out of every 1000 of the troops stationed at the various garrisons throughout the empire, the percentage constantly ineffective from sickness was smaller in this country by 7 per cent. than at Gibraltar, which was then taken as the type. I think it can be satisfactorily proved that Canada is expressly fitted to develop a hardy race capable of great endurance. The races of the British Isles and the French race have certainly not degenerated here. Hingston proved this conclusively some years ago by observations made upon the medical students attending the various schools in this city. He found that the lumbar strength of the British Canadian of the third generation exceeded by twenty pounds that of the recently arrived English and Scotch students. But the French-Canadian of the tenth generation did better than all by nearly thirty pounds. Not only has the French-Canadian increased in strength, but also in height and weight over the original Normandy stock.

Has the intellectual improvement in our people kept pace with the physical? We are a modest people, but I think we can say with truth that it has. We have a very respectable literature of our own, but the best intellect of the country is as yet absorbed in the practical affairs of life, and has too seldom found expression in art and literature. It is not very long since a distinguished American littérateur, Charles Dudley Warner, gravely attributed what he called the literary inactivity of Canada to the coldness of the climate. He said, in short, that the cold benumbed our intellectual faculties, and we had to spend so much of our energy in trying to keep warm that none was left for any other purpose. It must be admitted that if we measure the intellectual capacity of our people by the number of

books produced in Canada the result is not all we might desire; but the climate is not to blame. Especially is it not the cold, for the winter is the season devoted pre-eminently to intellectual effort and intellectual amusement. If Mr. Warner had said that the heat of our summer was an unfavorable factor in our intellectual life he would not have shot quite so wide of the mark; he would not have been right, but he would not have been quite so wrong. The very vicissitudes of our climate, by training the system to endure severe physical conditions, must react favorably upon the mental attitude.

Canadian Spas.—We have in Canada several mineral springs of undoubted therapeutic value, and they are pretty generally distributed all over the Dominion, although differing materially in temperature and composition. The best-known Canadian spas are the Caledonia, the St. Leon, and the Plantagenet springs, in the province of Quebec, and the Banff springs, in Alberta. Other springs in the province of Quebec are the Abenakis and the Caxton. Besides these there are three or four artesian wells or springs. Of these the chief are the Laurentian spring, in the east end of this city (a mild alkaline water with sodium bicarbonate as its predominating ingredient), and the Radnor, a well of some considerable repute situated in the county of Champlain. This was discovered a very few years ago when boring for water to supply the workpeople engaged at the well-known Radnor Forges. It has been likened to the German Seltzer, many of the properties being alike. It bids fair to become a rival in time of the celebrated Apollinaris water, to which it is preferred by many. The well is over 400 feet in depth. In the province of Ontario the chief springs are the Winchester and the Preston, and those in the town of St. Catharines, near Niagara Falls. The best-known and the most popular are the Caledonian springs, situated on the line of the Canadian Pacific Railway about midway between Montreal and Ottawa, and about nine miles from the Ottawa River. They consist of four springs—the gas, the saline, the white sulphur, and the intermitting or Duncan spring. The first three are situated within a distance of three or four rods of each other, and the mouths of the latter two are not more than four feet apart. The intermitting spring is situated about two miles from the others. This is so named because the discharge of gas is not regular, some minutes elapsing between the periods of quiescence and disturbance. The average temperature of these springs is about 46° F. The intermitting has the largest percentage of chloride of sodium, and differs from all the others in possessing a greater portion of chlorides of calcium and magnesium. It has also nearly twice the proportion of carbonate of magnesium that the others contain. It has been found that, taken judiciously and under advice, these waters have a remarkable effect in subacute and chronic rheumatic conditions. People suffering thus are found flocking to Caledonia from all parts of this continent and even South America, especially during the months of July and August. Gouty conditions depending upon liver disturbances also

yield very readily to these waters. The waters of St. Leon and Plantagenet are similar in many respects to those just described, and, as a rule, suit the same class of patients.

All the springs so far mentioned yield cold waters. But Canada also possesses the most famous thermal springs on this continent.

Banff, now a picturesque town magnificently situated in the heart of the Rocky Mountains yet within the limits of that division of the Northwest Territories known as Alberta, has become one of our noted health resorts, although more on account of its remarkable thermal springs than for its climatic advantages. The town is built on the banks of the Bow and Spray Rivers, two large glacier streams, and is surrounded by mountains towering many thousands of feet above the level of the sea. The winter is short, beginning in December and ending in February, and is much milder than in Ontario. Very little rain falls, and the days, as a rule, are bright and cloudless. Prolonged periods of warm weather are experienced during winter. March and April are variable; May is warm and bright; June is the month in which the greatest rainfall occurs; July, August, September, and October are very warm and very dry, with cool nights. At all seasons, with the exception perhaps of June, the air is dry and notably aseptic. It is positively stated that no case of malaria or tuberculosis has ever been known to originate at Banff. Independently of the springs, then, Banff has much to recommend it from a climatological stand-point.

The far-famed thermal springs of Banff were discovered only some fifteen years ago during the construction of the Canadian Pacific Railway. At its source in the mountain-side the water has a temperature of 127° F., and the air is charged for some distance around with the steam emitted from the pool to which the water flows. The most recent analysis shows it to contain the following ingredients:

Calcium sulphate	56.85
Magnesium sulphate	12.39
Calcium carbonate	3.29
Sodium sulphate	15.60
Sodium carbonate	35.73
Silica	traces.
Organic matter	traces.

The waters of Banff have been used with great benefit in rheumatism, gout, sciatica, and glandular affections, in certain forms of skin disease, and especially, it is thought, in tuberculous affections of the skin and mucous membrane. Aided by the admirable climatic conditions the waters have also been found to benefit in a marked manner functional diseases of the liver, stomach, and kidneys, and tuberculous joint affections. In constitutions debilitated from any cause the activity of the skin is noticed to be increased, the heart and vascular system strengthened, and the muscular and nervous systems much improved in tone. Rachitic and delicate children are much benefited by the thermal springs. This seems a large order;

but the therapeutic effects of these springs have been carefully studied by competent medical men who have been stationed there for some years. The climate doubtless assists materially the action of the waters in very many cases.

I doubt if the Canadian profession sets a sufficiently high value on the therapeutic properties of our own mineral springs. When visiting the spas of Great Britain and Europe one is impressed by the caution exercised by patients in the method of using the waters which have been prescribed. There competent local medical men are always to be found who can give the proper advice regarding the water to be taken for the ailment from which the patient suffers, and the judicious use of baths. Here, unfortunately, in many places no professional advice is available, and the patient consequently does very much as he pleases, or as the hotel proprietor may advise, and in consequence more harm than good sometimes follows the use of the waters.

THE WORK OF PASTEUR AND THE MODERN CONCEPTION OF MEDICINE.[1]

BY PROFESSOR CHARLES RICHET,

Delegate of the French Government and of the Faculty of Medicine of Paris, to the Sixty-Fifth Annual Meeting of the British Medical Association.

Mr. President, Ladies, and Gentlemen,—It is not without emotion that I rise to address this learned assembly. I know indeed that I am addressing men who are not my fellow-citizens, but among them are some, *enfants de notre vieille nation gauloise*, who have the same mother tongue as we, they speak from childhood our beloved French language, they are thus a little more than my fellow-citizens, for they are my compatriots, and I feel myself animated by a truly fraternal affection for them, and, as to my English colleagues, they have given evidence of so much good will and of a courtesy so delicate that I need make no great effort to assure them of my gratitude. In one word, although a stranger, I seem to be among friends.

I am somewhat troubled also because I am addressing medical men and am speaking before a medical congress. Now, although I belong in some small degree to the great medical family, since my father has conferred honor upon the profession of medicine by his labors and by his works, and although I have the great honor to be the delegate of the Faculty of Medicine of Paris, yet I am not a medical man, and a physiologist displays some temerity in venturing to speak before you on medical matters.

[1] Translation of an address which was delivered in French before the British Medical Association at Laval University, Montreal.

The Reconciliation of Medicine and Science.—Still I have an excuse. It is this, that I desire to attempt to bring about a complete reconciliation between medicine and science. It may seem that this is a commonplace, and that any such attempt would be unnecessary. But it is not so, gentlemen. We might find, perhaps, somewhere, not, I am sure, in this assembly, medical men ready unhesitatingly to assert that there is discord between medicine and science, and that all those sciences which are called ancillary—physics, chemistry, physiology—are *impedimenta* with which the clinician has nothing to do. Yes, there are to be found in the world medical men, among them even men of high attainments, who are ready still to say, "What have I to do with your experimental science? Observation of the sick and clinical study are worth more than all your clever experiments, and it is not from laboratories that the means of curing disease can come." Such an opinion appears to me to be erroneous, and I would, with all the energy which I possess, help to upset it. I hold that it is by experimental science alone that medicine has made and can make progress. It will suffice to describe the work of Pasteur, my illustrious master, in order to give you a convincing demonstration of this.

I shall not be contradicted when I say that the value of this work is greater than all that the history of medicine has given us since the commencement of our era. Through his labors everything has been renewed, regenerated, and, thanks to him, medicine has made more progress in twenty years than had been made previously in twenty centuries.

The Life-Work of Pasteur.—Louis Pasteur was born at Dôle in the Jura in 1821, and at the beginning of his career gave himself up to the study of chemistry. He became deeply interested in a difficult and important problem—molecular dissymmetry. Here was a question in pure chemistry which would seem to take us very far from medical questions, but it was to lead Pasteur directly to the study of fermentations. If a solution of tartaric acid (in the form of tartrate) be left untouched, a change occurs after some time in the chemical constitution of the liquid, which before Pasteur's time had been overlooked. The original solution has no action on polarized light, but after fermentation this same solution has become capable of deflecting polarized light. Pasteur explained this phenomenon by showing that the original tartaric acid is a mixture of an acid deviating light to the right with an acid deviating it to the left, and that a process of partial decomposition takes place; one of the acids is destroyed and the other is not altered, so that the action upon polarized light, previously masked by the mixture of the two acids, becomes evident. Here we have a fundamental experiment. It is told how, when the young Pasteur desired to show it to Biot, that great physicist who had discovered the phenomena of polarization, the old *savant* grasped the trembling hand of the young man and, before beginning the optical examination of the crystals submitted to him by Pasteur, said to him, with tears in his eyes, "*Mon cher enfant*, I have loved science so much that in face of the beautiful ex-

periment which you relate to me I cannot prevent myself from being deeply moved."

The explanation given of this phenomenon at that time was that the tartaric acid was decomposed by fermentation. Men were then content to use this magic word which appeared to explain everything, but which in reality told nothing at all. Neither Lavoisier, nor Liebig, nor Frémy had been able to discover its meaning, and were reduced to the theory of half-organized matter—a childish conception worthy of Paracelsus.

One of Pasteur's experiments, perhaps the most beautiful which he ever made, demonstrated the nature of this mysterious phenomenon. If a sugary solution of carbonate of lime is left to itself, after a certain time it begins to effervesce, carbonic acid is evolved and lactic acid is formed, which decomposes the carbonate of lime to form lactate of lime. This lactic acid is formed at the expense of the sugar, which disappears little by little. But what is the cause of this transformation of sugar into lactic acid? Well, Pasteur showed that the efficient cause of this chemical action was a thin layer of organic matter; that this layer of organic matter consisted of extremely small moving organisms which increased in number as the fermentation went on. Their growth it is, then, which produces the phenomenon of the transformation of sugar of milk into lactic acid. If, for example, we take a sugary solution in which all pre-existing germs have been destroyed by heat, no lactic fermentation will take place. But if we introduce into this sterile liquid a small quantity of this layer of organic matter, such as can be obtained from any liquid in which normal lactic fermentation is taking place, we shall see the lactic acid again form rapidly in the new solution.

Let us dwell a little on this admirable experiment. Nowadays it seems to us so extremely simple that we can scarcely perceive its importance. It seems to us now, in 1897, that from all time we must have known that an organic solution when heated was sterile, and that a germ would suffice to render it capable of fermentation. But this is a mere delusion. No, a thousand times no! This great fact of the generation of germs was absolutely unknown before Pasteur, and the method of sterilizing liquids and of their inoculation with spores was revealed to us by Pasteur. It is the nature of great discoveries that they become popularized in a short time, and thus very quickly become elementary. A first year's medical student knows perfectly that which neither Lavoisier, nor Liebig, nor Frémy, nor any one before Pasteur had been able to perceive. We are always tempted to be ungrateful to great creators, for their creations pass rapidly into the domain of common knowledge; they become so simple that they cease to surprise us. We do not think of being grateful, and we forget the efforts which genius has had to make to wrest the truth from jealous nature. Gentlemen, let us not be ungrateful, let us remember that the recognition of the real cause of all fermentation (the development and germination of organized elements) dates from 1857 and from the celebrated memoir of Pasteur upon lactic fermentation. A new world was then opened to science.

Nevertheless, this memoir of Pasteur's, containing one of the fundamental discoveries of the century, was not welcomed as it ought to have been. At first its importance was not understood, and afterwards absurd contradictions were opposed to it. A whole series of beautiful and decisive experiments were necessary to prove that there was no such thing as spontaneous generation, and that sterile liquids remained sterile indefinitely so long as no germs were introduced into them. Pasteur devoted six years (1857–1863) to the proof of the fundamental fact that "organic liquids do not alter until a living germ is introduced into them, and living germs exist everywhere."

The Microbic Theory of Disease.—A great step yet remained to be taken. This was to determine the evolution of these germs, not merely *in vitro*, but in the living organism. We to whom the idea of parasitism and microbic infection is now so familiar can scarcely conceive that it has not always been thus.

The microbic theory has become so ordinary, so popular, that we are tempted to believe that the part played by microbes was understood even in the times of Hippocrates; but I assure you that in truth this was not the case, and for long enough after Hippocrates the power of microbes was not known.

Pasteur, to whom, and to Sédillot and Littré, we owe the word microbe, was the first also to explain to us in his essay on the silkworm disease, published in 1867, the part microbes play in the production of disease. He proved that the bright corpuscles found in the bodies of diseased silkworms are living germs—a distinct living species, a parasite which can multiply and reproduce itself and disseminate the contagion.

It was therefore with painful astonishment that I heard Professor Marshall Hall recently say that the discovery of the part played by microorganisms in disease was due to Koch and dated from 1876. Now, ten years before this, Pasteur had published his experiments on *pébrine* and *flacherie*. Davaine had shown the part played by bacteria in anthrax infection, and the idea of infection and of contagion by microbes in the higher animals as well as in the lower had become a commonplace, not indeed in the medical world, but in all laboratories.

Thus, by successive steps, did the work of Pasteur develop in all its greatness and logic. In the first place, in order to elucidate a chemical problem, he studied tartaric fermentation, then he was led to study lactic fermentation, and he showed that they were biological phenomena. He then pursued the analysis of these phenomena with all the consequences, and was led to the conception that disease was due to the development of a parasite.

The normal living being follows out its course of growth without the development of any organic parasite in its tissues or in its humors. But if these humors or tissues happen to be inoculated with an organism capable of developing, then this small living thing multiplies, the higher organism

is infected, and the whole body becomes, as it were, a culture-fluid, in which the pathogenic microbe propagates itself, a centre of infection which scatters the disease by sowing the noxious germs wherever it goes. Thus arose the new conception, profoundly new not only for medicine but for hygiene—*disease is parasitism.* From thenceforth we understood the meaning of the words "infection" and "contagion," previously mysterious.

It is true that Pasteur did not discover all the microbes of all contagious diseases, but this is of small moment since he was the first to discover that infection was a phenomenon of microbial parasitism. All those who after him have proved points of detail, however important or fundamental they may be, have but followed the path traced by the master. Whether they will or not, they are all the pupils of Pasteur, as those who follow the study of chemistry are pupils of Lavoisier.

The greatest of Pasteur's disciples, Robert Koch, although with some ingratitude he refuses to recognize his master, has only perfected certain points in *technique* and applied his ingenuity and his perspicacity to the solution of questions which in spite of their practical importance are still secondary. He has not, in fact, been able to do anything new except upon points of detail: all that is essential came from Pasteur himself.

Need I say that this idea of the microbe, of the parasite, has become the basis of medicine? If we take up treatises on pathology written before this prodigious revolution, we shall be astonished by the insignificance and the nothingness of these very ancient books. Yet they are not really very old, they are dated 1875 or 1880, but as one reads them it seems as though several centuries must have intervened between these venerable writings and modern books. I know an excellent article on tuberculosis written in 1878, before the microbe of tuberculosis had been discovered. Well, this article belongs to another age, it belongs no longer to medicine, but to the history of medicine, for it swarms with mistakes and incredible errors with regard to pathological anatomy, etiology, prophylaxis, treatment—in fact, from every point of view.

In ten years medicine has been entirely overturned and re-made. It is being re-made every day. Every day brings some new discovery in matters of detail, but the great principle is always there, and it must always be attributed to the one initiator.

This is not all. Another new and great discovery was to be made by Pasteur himself, and to constitute the supreme development, the culminating point, as it were, of his life's work. This is the principle of vaccination. By a series of researches, admirable for their precision, Pasteur proved that the pathogenic microbe could be attenuated,—that is to say, rendered incapable of causing death. But, though this microbe does not cause death, yet it can produce the disease, a disease sometimes so attenuated as to be almost imperceptible. Now the living being which has suffered from this attenuated disease is protected against its more serious forms, and, borrowing the word consecrated by the immortal discovery of Jenner, Pasteur said that we have here *vaccination.*

Fermentation, infection, contagion, vaccination: here in four words we have the work of Pasteur. What more need I say? Do not these four words possess, in their simplicity, unequalled eloquence?

Can any one longer maintain that the progress of medicine is not due to experimental science? Does not all this knowledge of microbes and of the part which they play in disease imply, immediately and necessarily, immense progress in therapeutics?

Antiseptic Surgery.—To take but one example, I will cite the application of microbial theories to surgery.

There was a time when erysipelas, purulent infection, and hospital gangrene decimated those upon whom operations had been performed, and puerperal infection claimed a terrible number of victims. It seems to us nowadays that the medical profession before 1868 was blindfolded and that their blindness was almost criminal. These are now no more than historic memories. A sad history, doubtless, but one which we must look at coolly in order to understand what science can do for medicine. Left to their own resources, practitioners of medicine during long centuries could do nothing against erysipelas, against purulent infection, against puerperal infection; but, basing itself upon science, surgery has been able to triumph over these odious diseases and to relegate them to the past.

Let me here introduce a reminiscence. When, on the occasion of his jubilee, a great celebration was prepared for Pasteur in the Sorbonne, in the presence of the leading men of science of the world, there was a moment when all hearts were softened—the moment when the great surgeon who was the first to perceive how to apply to the practice of his art the theory of pathogenic parasites, when Lord Lister drew near to Pasteur and gave him a fraternal embrace. These two great benefactors of humanity, united in their common work, afforded a spectacle never to be forgotten, a striking reconciliation of medicine with science.

But the apogee of the glory of Pasteur was the discovery of the new treatment of hydrophobia. No one of his scientific conquests was more popular, and from France and from the whole world there arose a long cry of admiration. Perhaps in the eyes of biologists this discovery possesses less importance than his labors with reference to the fermentations and to vaccination, but for the public this was the chief part of Pasteur's work. And men of science also were forced to admire the scientific courage of Pasteur, who, putting aside the precise methods which he had discovered and taught, knew how to devise new methods to meet the exigencies of the circumstances, and how to put them victoriously into practice.

Thus was finished the work of Pasteur. He was spared to take part in the triumph of his ideas, and to be a witness of his own glory. If, like so many creators, he had sometimes in his earlier days known conflicts and hatreds and petty quarrels and foolish objections, nevertheless he had not to deplore the ingratitude of mankind. He died full of honors, surrounded by admiration, respect, and love. For him posterity had already commenced when he died.

The Union of Medicine and Science.—And now let us turn back to consider the indisputable union of medicine and science. This, in fact, is what ought to strike us in the work of Pasteur. It is not only in general biology and in the progress of our knowledge that his work is great, it is still more in its immediate practical applications. The great biologists of our century, Lavoisier, Claude Bernard, Darwin, have, without doubt, left behind them work which by reason of its conquest of new truths is not inferior to the work of Pasteur, but these new truths do not lead to any such immediate application as antisepsis, the treatment of hydrophobia, anthrax-vaccination, or the prophylaxis of infectious diseases. Pasteur was not only a man of science, he was also a philanthropist, and there is scarcely one who can be compared with him as a benefactor of suffering humanity except Jenner, who found out how to preserve thousands and thousands of human beings from the most hideous of all diseases.

Further, Pasteur brought back medicine into the true way of science. Even after Magendie, Müller, Schwann, and Claude Bernard, it might still have been asked whether all these experiments establishing so many important truths had really been of any advantage for the relief of the sick. To discover, as did Schwann, that living beings are an aggregate of cells; to prove, as did Claude Bernard, that the liver forms glycogen; to establish, as did Darwin, that living species can be transformed by the influence of long-accumulated variations in the environments—these are admirable pieces of work, but work in pure science which had not any immediate therapeutic results. Strictly speaking, then it was possible to maintain that clinical medicine did not derive any benefit from such investigations. I do not for a moment believe that this opinion had a shadow of foundation, but before the time of Pasteur it was not so absurd as it has become since Pasteur. Since Pasteur no man can, without incurring the charge of monstrous ineptitude, refuse the rights of citizenship in medicine to experiment and to biology.

And, to speak the truth, men of science and biologists, as though their ardor had been redoubled by the renovation of medical ideas, have during these last ten years made discoveries which have introduced into medical science new elements which clinical observation alone had been absolutely incapable of discovering. I will cite a few examples: the action of the thyroid gland, the Röntgen rays, pancreatic diabetes, and serum therapeutics.

Action of the Thyroid Gland.—Physiologists had shown long ago that the ablation of the thyroid gland led to serious results. Schiff had proved this as long ago as 1857, but the explanation of the phenomenon did not become clear until Claude Bernard, but especially Brown-Séquard, had demonstrated the existence of internal secretions of glands pouring into the blood their products which probably neutralize certain toxic substances. This very naturally led Pascale and Gley to inject into animals from whom the thyroid gland had been removed the juice of the thyroid,

and this prolonged their lives. The therapeutic conclusion to be drawn was obvious, namely, to treat the unfortunate subjects of cretinism or of diseases of the thyroid gland by the injection of extracts of the thyroid body. You know that the result has been most happy. This new treatment was a true experiment, and, as is the case with so many experiments, the actual result has been a little different from that which was expected. The ingestion of thyroidin is not only a means of curing goitre and cretinism, but is also a treatment, sometimes remarkably efficacious, for obesity.

The Röntgen Rays.—The discovery of the Röntgen rays excited general enthusiasm, and as a matter of fact it is one of the greatest conquests of contemporary physics. Most assuredly medicine had nothing to do with it. The research was made and the success was obtained in a physical laboratory. Now, you are not unaware that these Röntgen rays have been called to play a part, if not in the treatment, at least in the diagnosis, of diseases, a part the importance of which goes on increasing from day to day. Physicists have discovered the principle; it is for medical men to follow up its application.

Pancreatic Diabetes.—The existence of pancreatic diabetes was suspected vaguely by a clinical physician, Lancereaux, but the means which clinical medicine and pathological anatomy placed at his disposal did not give him the power to solve the problem. In spite of his perspicacity, he could do no more than note a certain correspondence between diabetes and lesions of the pancreas. How could more have been learnt if we had not the resource of experiment? Two physiologists, Mering and Minkowski, have had the good fortune to show that ablation of the pancreas determines glycosuria, to show that there is a pancreatic diabetes, and they have studied its various conditions with great ability.

Serum Therapeutics.—I come now to serum therapeutics, a direct consequence of the labors of Pasteur. This is a mode of treatment born of the experimental method alone. Here again science has done for the art of medicine that which clinical observation, left to its own resources, could never have accomplished.

Permit me now to show how serum therapeutics is derived directly from physiology and experiment, and pardon me if I am forced to speak of my own work; I shall do so, I hope, without any vanity. I know very well that we always owe to our predecessors and to our rivals much more than our pride admits, and that the experiments and the ideas which succeed are not always those which have been conceived most methodically.

About 1887 M. Chauveau had shown that French sheep could contract anthrax, and that they are very easily infected by the *Bacillus anthracis*, the microbe of anthrax, if small quantities of the bacillus be injected under the skin. But Algerian sheep seem to be safe from the disease. In vain is the *Bacillus anthracis* injected into them: they do not contract anthrax. They are refractory to this disease and possess a remarkable immunity to it. Having reflected on this strange fact I framed the hypothesis that the

cause of the immunity of the Algerian sheep, which are absolutely similar from the anatomical and zoölogical point of view to French sheep, depended upon chemical substances contained in the blood, and that in consequence we might hope to confer immunity on French sheep by transfusing them with the blood of the Algerian sheep. It is, however, difficult to make experiments on sheep. Therefore, with my friend Héricourt, who has been throughout these researches my tireless fellow-worker, I took animals of two different species, the common victims of physiologists—rabbits and dogs.

Just at that time we had been studying a microbe nearly related to the *Staphylococcus albus*, the *Staphylococcus pyosepticus*, which in rabbits produces enormous subcutaneous swellings when injected under the skin and causes death in 24 or 36 hours. The dog, on the other hand, seems to be almost refractory to inoculation with this microbe. We therefore attempted to transfuse the blood of the normal dog into rabbits by intravenous injection, but this operation did not succeed, for the transfusion of dog's blood into the veins of the rabbit, even in a dose of only ten grammes, rapidly causes death.

It then occurred to us to resort to peritoneal transfusion in place of intravenous transfusion. In this way we were able to introduce into the organism of the rabbit 50 or 60 grammes of dog's blood, and had the good fortune to see the experiment succeed completely. Rabbits transfused with the blood of the normal dog survived the inoculation of the microbe for four or five days, and rabbits transfused with the blood of a dog vaccinated against the microbe did not die, and were in fact hardly ill at all.

This experiment, which was made on November 5, 1888, is, it seems to me, the very basis of serum therapeutics. It in fact proves that the blood of animals refractory to a disease contains chemical bodies which counteract the effects of the specific pathogenic microbe of the disease. We understood its importance from the first, and, having established the general pathological principle, we resolved to apply it to a disease of man.

For several days, then, Héricourt and I debated the question whether we should experiment with one or other of the three diseases—anthrax, diphtheria, or tuberculosis. Unfortunately, we decided for tuberculosis. Its microbe is easily cultivated and, as you know, it produces greater ravages among men and animals than any other disease. We set to work at once, but, as you will understand, time was required before we could obtain definite results. Still, in a year's time we were able to show that the injection of dog's blood into rabbits retarded enormously the development of tuberculosis. It was, nevertheless, necessary to pass from experimental physiology to human therapeutics. Taking advantage of an observation of Bouchard's to the effect that the serum of refractory animals is as active as the whole blood, we were able to inject the serum in tuberculous diseases. The first sero-therapeutic injection was made by us on December 6, 1889.

At first we had for a space great hope. Yes, in truth, for several weeks we believed that we had discovered the heroic treatment for tuberculosis. For several weeks the various patients that we had under treatment found that their strength was renewed, that their appetite returned, that their weight increased, and that cough and expectoration disappeared almost completely. But, alas, it was no more than a transient improvement. A month or a month and a half later the pitiless disease resumed its course, and the sero-therapeutic treatment turned out to be inefficacious. Happily, while by the most diverse plans we were in vain searching for a method of treating tuberculosis by serum, a German experimenter, Behring, after studying the effects of the serum of refractory animals upon diphtheria, showed (in 1892) that this serum is wonderfully efficacious in the treatment of the disease. He applied the serum method of treatment not only to diphtheria, but also to tetanus, and, at first in animals and afterwards in man, he obtained results which were really marvellous. Gentlemen, you know the rest, and I need not tell you that this sero-therapeutic method, improved and popularized by Roux in 1894, is now a treatment without compare. The statistics on this head are absolutely conclusive. The mortality of diphtheria, which was 45 per cent., has fallen to 15 per cent. That means for the city of Paris alone an annual saving of about 1000 human lives; for the whole of France nearly 10,000 lives. We may take the same proportion for Italy, Germany, England, the United States, Canada, and Russia, and may estimate the number of infants which serum therapeutics snatches from death at about 50,000.

In other diseases the results of serum therapeutics have been much more open to criticism, and it would be necessary, in order to arrive at a satisfactory conclusion, to discuss them in detail. I cannot attempt to do this here, for it would be an abuse of your patience. I will content myself by venturing the opinion that serum therapeutics has not said its last word. The organism is endowed with a marvellous power of resisting the poisons secreted by microbes. It sets to work in its turn to secrete counter-poisons which neutralize the poisons secreted by the microbe. The antitoxins of the organism combat the toxins of the parasite, and in the future the art of serum therapeutics will be to seek in these resisting organisms the antitoxins fabricated by their cells.

Thus, on whatever side we turn, we find that medicine has always been guided by experimental science. By experiment and by science it is compelled to march forward. This was true in the time of Harvey, for that immortal physiologist had to meet the opposition of physicians. This was true also in the time of Lavoisier, when by a few decisive experiments he proved the chemical nature of the phenomena of life. But how much more true is it at the present time, since Claude Bernard and, above all, Pasteur have by experiment laid open a whole world and have warranted us in conceiving the widest hopes for the future of medicine!

The parts of the man of science and of the physician are very differ-

ent. The physician ought to be conservative, applying methodically the teaching and the precepts which he has received. He has no right to experiment upon his patients, or to permit human life or human suffering to be risked on fantastic theories. But the man of science ought to be a revolutionist. He ought not to be content with the doctrines which he has been taught. The opinion of the master ought to be but a light weight upon his mind. He ought to seek on every hand for facts which are new and even improbable. Darwin says somewhere that he had made the experiments of a fool, and often it is right to attempt that which appears contradictory to all the most received and classical opinions. Without the spirit of adventure, without this scientific daring which opens up new horizons, there is no progress.

The task of the explorer or of the pioneer is not that of the physician. He ought to be careful to keep himself abreast of all scientific progress, in order that his patients may have the benefit of it, but he cannot advance the progress of science save within restricted limits. Having no right to experiment, he is almost powerless to solve the difficult problems which arise.

It is the duty of the chemists, the physicists, and, above all, the physiologists, to guide medicine into the new ways. They have not to take the heavy responsibility of a human life upon their shoulders, and nothing ought to check their audacity. You, gentlemen, have not the right thus to be audacious; you need prudence and moderation, and, convinced as I am of the power of experimental science, I still think that the applications which the chemists and the physiologists suggest to you should only be accepted with considerable caution. It costs us nothing, after a few experiments which have succeeded fairly well, to say to the physician, "Try that on your patients." You know very well that our responsibility is *nil*, and that the ancient axiom *primo no nocere*, an axiom which ought to be your strict rule of conduct, does not in any way apply to us. You see, therefore, that it would be unjust to make it a matter of reproach to physicians and surgeons that they have not made great scientific discoveries. This is not their mission. It is theirs to relieve human suffering and to seek among new scientific truths that one which is most proper to relieve or to cure the sick.

Nor can I understand how any one should have wished to create an antagonism between medicine and science. To suppose that they are in contradiction is to show that we understand nothing about either the one or the other. It is not reasonable to assert that the one is superior or inferior to the other; they are different in their means and in their ends. They are mutually complementary, and both are equally necessary.

If I were ill most assuredly I would not seek the assistance of a chemist or of a physiologist, and medicine is not to be learned from the books of Claude Bernard or of Pasteur. Clinical instruction is necessary, such as long observation of patients alone can furnish. Prophylaxis, diagnosis,

prognosis, therapeutics, are not to be learned in scientific books. Something else is necessary—observation, long, patient observation, the old Hippocratic observation, without which there can be no good physician. Young students must be guided in the examination of patients by experienced practitioners, and no one, I presume, would be guilty of the folly of proposing to replace the clinical ward by the laboratory.

But without laboratories the clinical department must remain incapable of scientific advance, and this condition of stasis is assuredly undesirable. For in spite of all the progress which has been made, much yet remains to be done. Are not tuberculosis and cancer, for example, the disgrace of medicine? I appeal to all medical men here present. Is there any one of you, gentlemen, who in the presence of such painful modes of death does not feel himself humiliated to the bottom of his soul by his powerlessness?

Well, this feeling of our present powerlessness against disease ought to stimulate us to work. The work to be done is enormous, and we must none of us grow weary of our task. We physiologists must seek new facts, we must seek and seek again, seek always without being afraid of the boldest hypotheses, and without putting any limit to our audacity, without troubling our heads as to the practical consequences which may flow from our discoveries, having only truth, divine truth, for our object. As for you, gentlemen, it is your duty to follow with the warmest interest both the general effect and the detailed results of biological discoveries, in order to attempt to find some practical application for them. From this unceasing collaboration progress will be born. But it is necessary that men of science and physicians should both be animated with these two governing sentiments—faith in science and love of man.

THE SURGEON OF OLD IN WAR.[1]

BY WILLIAM MITCHELL BANKS, F.R.C.S.,
Surgeon to the Liverpool Royal Infirmary.

I AM greatly honored by having to deliver to you to-day an address in surgery. Fortunately for me, the title is a wide one, and I shall take advantage of that fact to diverge from the strict consideration of surgical disease, and shall offer you instead a brief sketch of some of the most notable work done of old by a body of members of our profession who have never received their due reward,—those, namely, who have devoted their lives to the succor of the sick and the wounded in war.

Military Surgeons in the Roman Army.—Twelve months ago my friend, Dr. Barnes, of Carlisle, ex-President of this Association, made me

[1] The Address in Surgery delivered before the British Medical Association at Montreal, September 2, 1897.

acquainted with a remarkable paper by the late Sir James Simpson, entitled "Was the Roman Army provided with Medical Officers?"—a paper exhibiting such profound learning, so charmingly written, and so little known that I need not make any apology for acquainting you with some of its chief points of interest.

The most careful investigations have failed to make out from their writings whether the Romans regularly appointed physicians and surgeons to their armies or not, although nearly every other question relating to their military organization has been treated of, sometimes very fully. Curiously enough, what little information we possess on the subject comes mainly from mortuary or from votive tablets. Borcovicus, in Northumberland—now called Housesteads—was one of the principal stations on the line of Hadrian's wall. Here, about seventy years ago, was found a monumental tablet, now in Newcastle Museum. On it is the following inscription:

D M	D(IIS) M(ANIBUS)
ANICIO	ANICIO
INGENUO	INGENUO
MEDICO	MEDICO
ORD COH	ORD(INARIO)COH(ORTIS)
I TUNGR	PRIMAE TUNGR(ORUM)
VIX AN XXV	VIX(IT) AN(NOS) XXV

The first Tungrian Cohort is known to have been present at the battle of the Mons Grampius, and to have served at Castlecary, at Cramond, near Edinburgh, in Cumberland, and at Housesteads. The tablet is highly ornamented, and antiquarians hold that a rabbit and round bucklers carved in the upper part, which are emblems of Spain, show that the young military doctor was probably a native of that country. From various works treating of Roman inscriptions, Simpson was enabled to find that four more tablets, in which surgeons of cohorts are mentioned, existed. They were found at Rome. One of them is a votive tablet, the inscription upon which intimates that it was dedicated by Sextus Titius Alexander to Æsculapius and to the safety of his fellow soldiers. It was cut in the year of the consulship of F. Flavius Sabinus, which is known to have been A. D. 83. As the Roman legion consisted of ten cohorts, it is interesting to know that there were not only medical officers attached to each cohort, but also one attached to the legion—a sort of surgeon-colonel, as we should call him nowadays. Three tablets have been discovered in which the *medicus legionis* is mentioned. One found at Verona was a tablet raised by Scribonia Faustini to her dearest husband, J. Cælius Arrianus, medical officer to the Second Italian Legion, who died at the age of 49 years and 7 months. Furthermore, Simpson rooted out of Mommsen's Latin inscriptions of Naples, a tablet, now in the Dresden collection, which was found in the Elysian fields near Baiae, close to the Portus Julius, which

was the station of a division of the Imperial fleet. The inscription tells that M. Satrius Longinus, *medicus duplicatorius* to the trireme Cupid, and the heirs of those freed by Julia Veneria erected the tablet to the manes of that deserving lady. The term *duplicatorius* means that by reason of long or meritorious service he was entitled to double pay and rewards. These little gleanings from Simpson's paper show what an interesting one it is, and one is astonished at the labor that must have been expended in digging up the information contained in it.

Ambroise Paré.—Hundreds of years went past before there came upon the scene any military surgeon of note, but when he did appear he was a man of transcendent merit—the illustrious Ambroise Paré. From 1517 to 1590, for seventy-three years he lived a long and incessantly active life, the contemporary of Vesalius, the immediate predecessor of Harvey. We have only time to glance at the soldier-surgeon side of Paré's life. For over thirty years he followed the wars under four kings of France—Henry the Second, Francis the Second, Charles the Ninth, and Henry the Third, with intervals of a few years at home in Paris. Perpignan, Metz, Verdun, Rheims, Hesdin (where he was taken prisoner and had to write to his wife for his ransom), St. Quintin, La Fère, Amiens, the taking of Rouen, Dreux, Moncontour—these are but some of the bloody battles and sieges at which he was present. Through them all his humanity, his love of his profession, his independent character, and his jovial, frank disposition carried him safe, and made for the son of the poor country joiner warm friends among the greatest and noblest warriors of France. Even that miserable monster, Charles the Ninth, loved the Huguenot surgeon, and when the awful day of St. Bartholomew came, Paré was spared to tend his wretched master through the brief term of agonized and remorseful life that was given him. The description in Dumas's novel, "The Two Dianas," of the wound of the famous warrior, Duke of Guise, where the lance entered above the right eye and came out between the nucha and the left ear, breaking short off, and how Paré lugged it out, with the chance that when it did come, one terrible gush of blood would finish his illustrious patient's life and his own career at the same moment—the picture of all this is real history.

Amid all the splendid work, both anatomical and surgical, which Paré did, the application of the principle of the ligature to bleeding arteries is, of course, that with which his name will be forever associated. In this day of grace it is impossible for us to imagine the horrors that awaited a wretched man so soon as his limb was cut off and the process of stopping the bleeding began. Think of the raw and exquisitely sensitive stump exposed to the red-hot cautery or plunged into boiling pitch! For this frightful treatment Paré substituted the ligature, which in our own day, employed in the form of an aseptic animal material which the tissues quietly absorb, has practically reached the pitch of perfection. In his time, too, there was a fixed belief that the danger from gunshot wounds

arose from the poison of the gunpowder conveyed on the bullet. To destroy this poison the treatment was to pour into the wound boiling oil in which elderwood bark had been stewed. On one occasion, not having this infernal concoction at hand, Paré used a cold mixture of yolk of egg, oil of roses, and turpentine to his wounded soldiers. He passed a sleepless night from dread that this would injure those to whom it had been applied, and his delight next day was proportionately great when he found that they had had but little pain, while their wounds were free from inflammation and swelling. This was his panacea for wounds ever afterwards. There are, of course, persons who wish to make out that he was not original in the matter of the ligature. He himself says this about it: "Taught me, as I interpret it, by the suggestion of some good Angel, for I neither learnt it of my masters nor of any other man. And thus I wish all chirurgions to doe. For it is not in our Art, as it is in civil affairs, that prescription, law, or authority should prevail over right reason." But these cavillers have doubtless never heard of an ancient proverb which says that there is nothing new under the sun. In spite of them, the world will ever believe in a glorious trio—Paré, the Frenchman, who invented the ligature; Morton, the American, who discovered anesthetics; Lister, the Englishman, who introduced antiseptics. In the fulness of years, possessed of affluence and surrounded by friends, died Paré, the whilom poor barber-chirurgeon, now a councillor of state and surgeon-in-chief to the king. One final touch will perhaps reveal a sentiment that permeated and guided his every labor. On one occasion, after the successful treatment of a wounded officer, he made this wise and reverent remark, afterwards adopted as his motto: "*Je le pansay; Dieu le guarist*"—I treated him; God cured him.

Robert Clowes.—Coming to England, a surgeon who saw no little fighting was Robert Clowes, who was born somewhere about 1540 and died in 1604. He served in France in the army commanded by the Earl of Surrey, and was afterwards for several years in the navy. He then began practice in London, and was made surgeon to St. Bartholomew's and Christ's Hospitals. But after being about fourteen years in the civil practice he was dispatched by Queen Elizabeth's orders into the Low Countries to attend upon the Earl of Leicester, commander of Her Majesty's forces. He was at Zutphen when Sir Philip Sydney was killed. His last piece of service was a glorious one, he being with our fleet that defeated the Spanish Armada. It is told of him that he always kept beside him his military surgical chest with the bear and ragged staff of his old chief Leicester on the lid. He finally settled down once more in London, where he was very successful in practice, and was made surgeon to the queen. He wrote several works in English, of which the most important is entitled "A profitable and necessarie Booke of Observations for all those that are burned with the flame of gunpowder, &c., and also for curing of wounds made with musket, and caliver shots, and other weapons of war commonly used at this day both by sea and land." A good half of this treatise is

occupied with a record of surgical cases of note which he had treated, and this renders the work very entertaining, inasmuch as we get an accurate and positive knowledge of everything that was done for a wounded man in those days, while there are numerous little side touches very characteristic of life at the time it was written. He tells us, for instance, of "The cure of one Master Andrew Fones, a merchant in London, which, being in a ship at the sea, was set upon by the Flushingers, in which fight he was very dangerously wounded with gunshot." There is "The cure of Henry Rhodes, one of the waiters at the Custom House, he being upô the River of Thames a skirmishing with his peece, and by reason the peece had certain flaws in it, did break into many peeces, and made a great wound upon his chin, and carried away a good part of the manduble and the teeth withal; moreover, it did rend his hand greatly; all of which I cured without maime or deformitie." There is "An observation for the cure of the master of a Hoy that had both his legs fractured and broken into many peeces with an iron bullet, shot out of a great basse or harquebusse of crocke at the sea by a Pyrat or sea rover." These few titles will give you an idea of Clowes's clinical cases. The importance which attaches to them, and the reason why they constitute a distinct advance in the science of surgery, is that the author gives his actual experiences and tells us what he did to his patients, whereas at that period the tendency was to write endless commentaries on ancient writers, to whose every dictum the blindest and most unreasoning respect was paid.

Peter Lowe.—Contemporary with Clowes was a most interesting character—Maister Peter Lowe—who was born in Scotland about 1550 and lived some sixty or sixty-five years, reaching well into the seventeenth century. Like many of his countrymen, he went to France when very young, where he lived for, some say ten, some twenty years. Then he returned to Glasgow, where he lived and died a citizen of much renown, having obtained in 1599, from King James the Sixth, a charter for the Faculty of Physicians and Surgeons of Glasgow, which he thus founded. A few years ago Dr. Finlayson published a most charming account of Maister Peter.

His most important work is termed "A Discourse of the whole art of chirurgery, compiled by Peter Lowe, Scottishman, Doctor in the Faculty of Chirurgerie at Paris, and ordinary Chirurgion to the French King and Navarre." The first edition dated from 1597, and is one of the earliest, if not the very earliest, work embracing the whole art of surgery published in English. It is clear that Lowe must have seen a good deal of military service abroad, being "Chirurgion Major to the Spanish regiments two years at Paris, and since that time following the king of France my maister in the warrs." In his day, as we have seen, the surgical world was still greatly exercised about gunshot wounds and burning by gunpowder, as it was believed that they were injuries of quite a peculiar and very poisonous character. Lowe, however, treats of them with great good sense. Thus: "*Of Wounds done by Gun-shot.*—These wounds come indifferently to all

parts of our body, whereof there are divers opinions; some think that there is a venenosity in the powder, and burning in the bullet, which is false, for the things whereof the powder is ordinarily made, as Brimstone, Saltpeter, coales of divers sorts of trees, Water, Wine, and Aquavitæ have no venenosity in them; likewise there is no burning in the bullet, for if the bullet of lead being shot a great way, should burne, through heat would be melted itself. I have cured divers within these thirty years of divers nations which have followed the warres in France and other countries, in the which I have found no more difficulty than in any other contused wounds." Here, again, we have a most important advance made by a military surgeon, for only those who are acquainted with the medical literature of Lowe's time can understand the ridiculous views then held about gunshot wounds, and the dreadful consequences to the patients which followed from them.

We have seen that Paré lived between 1517 and 1590, and that Peter Lowe was in France between 1570 and 1580; consequently, he probably learnt all about the ligature for the arrest of hemorrhage. When treating of amputations he describes the whole process of the operation up to the removal of the limb. Then he says: "One of the assisters shall put the extremities of his fingers on the great veins and arteries to stay them from bleeding till the Chyrurgion either knit or cauterise them one after another. Where there is putrefaction we stay the flux of blood by Cauters, actuals, and where there is no putrefaction, malignitie nor humor venomous we use the legator." He narrates the case of a certain valiant Captain Boyle, of the Spanish troops, whom he, in the capacity of Chyrurgion-Major to the regiment, was summoned to treat for an "aneurisme on the right side of his cragge." Lowe ordered it to be let alone, "but the captain sent for an ignorant Barbor who did open the swelling with a Launcet which being done, the spirit and bloud come forth with such violence that the Captain died in a fewe howers after." Having duly castigated the Ignorants who do such things, Lowe observes that his treatment for such cases is first to draw blood in both arms, and then to apply on the tumor "Rec, Pulveris subtilissimi boli arminici, sanguis draconis, myrtilorum, lapidis calaminaris in aceto extincti, absinthil ad unc, cum cerato refrigerantis Galeni quantum sufficit, fiat unguentum." Curious to note how, even in men of distinct ability like Lowe, a complete ignorance of pathology dragged them into the perpetration of the silliest empiricism.

Woodall's "Viaticum."—In 1628 appeared the first work in England specially devoted to military and naval surgery. Some eleven years later a second edition appeared, and this is its title, "Viaticum, being the Pathway to the Surgeon's Chest, containing chirurgical instructions for the younger sort of surgeons imployed in the service of his Majestie or for the Common-Wealth upon any occasion whatsoever intended for the better curing of wounds made by Gunshot," by John Woodall. A perusal of the "Viaticum" shows that Woodall was a very practical surgeon and emi-

nently religious man, and the way in which he mixes up pills and piety is sometimes very diverting. After some excellent general advice to the surgeon's mate, including warning against "being given and dedicated to the Pot and Tobacco-pipe in an unreasonable measure," he enumerates "the instruments for the Surgeon's Chest," including, among others, "Catlings, Rasours, Trapans, Trafine, Lavatories, Cauterizing Irons, Storks bills, Ravens bills, Crowes bills, Terebellum, Probes or flamules, Glister Sirings and" (what would have utterly damned his book in the present day) "one bundle of small German instruments." Then comes a list of medicines under the headings Unguentum, Aqua, Sol, Oleum, Chemicall Oyles, Syrups, Conserva, Electuariæ, and so on, winding up with a list of the Simples, and of the Herbs and Roots most fit to be carried. A long and careful description of the uses of the instruments and drugs follows, and then come chapters on wounds, apostumes, fractures, dislocations, amputation, scurvy, the plague, gangrene, and other topics. He observes that the cauterizing irons had gone somewhat out of fashion, and he did not use them much himself "because of the feare they put the Patient into and for speech of people who are ready to scandalise an Artist upon each light occasion." In amputation, moreover, they are "now wholly forborne for reasons aforesaid, and for that a more pleasant course is known better for the patient and the Artist by making a ligature upon the veine, wound or artery, which is the binding of each end thereof, being first caught and holden with some fit instrument, and tied with a sure and strong thread."

Woodall advances the cure of wounds a distinct step, once more putting us under an obligation to the soldier-surgeon. This he does by sharply attacking all through his works the inordinate and meddlesome use of strong caustics. He says that he had seen men lamed by the needless use of caustic medicines, even in slight wounds, to which if any old wife had only applied her one salve for all sores no such thing had happened. "They will not see a wound incarne and red and good flesh to grow, but straight they slander it of pride, and call it proud flesh, like their owne; and then must at the fairest Precipitate or Vitriale burnt goe to work, yea though the Patient be lame for it, or at the least the griefe put back again."

Richard Wiseman.—I wish I had time to give you a proper account of the adventurous life of Richard Wiseman, who has been termed the Father of English Surgery, and that not without reason. Born in 1620, dying in 1676, he lived in the time of Charles the First, of the Commonwealth, and of Charles the Second. He was a naval surgeon to begin with, serving in the early part of his life in the Dutch navy. Being, however, a devoted royalist, he served with the armies of Charles the First, and after his death went into exile with his son in France. He was present at the battle of Worcester, where he was taken prisoner, and afterwards confined in Lambeth House for a while. During the Commonwealth he was naturally under a cloud, and even went off for three years to serve in the

Spanish navy. At the restoration the king did not forget his old surgeon, who had done and suffered so much in his service, but appointed him his surgeon-in-ordinary, and afterwards sergeant-surgeon. The first edition of his work, printed in 1672, is quite a small book, and is entitled "A Treatise of Wounds," but it afterwards expanded into a very large volume.

Nothing reveals a man like his own words, and so in trying to give you an idea of these old worthies I have let them tell their own stories. Wiseman believed in the need for giving stimulants to a man who was in the habit of taking them, if that man was in a dire strait. After describing the parlous case of a certain patient, it seems that the "man swooned and complained that he could not live without wine. I complied with his desire; he drank again as he pleased, his sickness went off, his wound digested, and he cured. This I have often seen in some of our Dunkirkers at sea, who drank extraordinarily, and were full of drink in our sea fights. I could scarce ever cure them without allowing them wine, and thereby their spirits were kept up, and I had the liberty to bleed them as I thought fit." From this it is clear that the old saying about Dutch courage has a distinct origin in fact. But if the unhappy Batavians were liable to be bled at once by the lance of the enemy and the lancet of the surgeon, one can hardly wonder at their taking something to keep their spirits up.

When speaking of gunshot wounds, he insists upon the bullet being searched for and extracted at once. "The part is at first dressing, with what diligence you can, to be cleared of all such Foreign Bodies as have made violent Intrusion into it, while the patient is warm with the heat of Battel, and the wound fresh and very little altered by either Air or Accidents, so that less pain must necessarily follow upon the extraction. In the *Armada Naval de Dunquerque*, where we Chirurgeons were oft employed in this Service, we after every fight went together visiting one another's wounded men. Amongst us it was thought a great shame if any of this work of Extraction was there to be done. It hath been the cause of the death of many a brave Souldier, and every Battel produces instances of it, to the discredit of our profession." This is good surgery and straight talk. I think it must have been a fine spectacle to have seen these rough old surgeons, with their limited knowledge and their miserable means of treatment, walking round to see each other's patients and learning how best to mend their mistakes.

He has a chapter entirely devoted to a great case of a fracture made by a splinter. The patient had his arm badly smashed above the elbow, and ought to have it amputated; but a sudden cry of fire stopped this. "I hastily clapt a dressing upon his arm and rouled it up, leaving his arm in his other hand to support it, and endeavoured to get up out of the hold as the others did, I verily believing I should never dress him or any of them more. But our men bravely quitted themselves of the Fireship by cutting the Sprizil Tackle off with their Hatchets (which they wore during fight sticking in their Shashes); we were freed of the fire, and by our hoisting

up the top sails got free of our Enemy. Now, I was at a loss what to do with this man, who lay not far off complaining of his arm. I would have cut off his arm presently with a Razor (the Bone being shattered there needed no Saw); but this man would not suffer me to dress his arm; he cryed 'it was already drest.' The Fight over, we got into next Port; I caused presently the Mariner's Bed to be set up (which was four pieces of wood nailed together and corded, and a Bear's skin laid upon it); this was fastened between two Guns to the Carriages." Wiseman then set hard to work to save this unfortunate mariner's arm; but "when it came to my turn to be visited by my brother Chirurgeons of our Squadron, they did not dislike the wound nor my way of dressing (for we, being used to see one another's Patients, had all much one way of dressing); but they laught at the excuse I made for not cutting off his arm, and doubted I should yet be forced to do it. But at the end of two months there was in this Patient a strong callus, filling up the void place of the lost Bone at least two inches, with little or no shortening of the arm." Well done, Wiseman!

Baron Larrey.—Up to the time of the French Revolution it is clear that military surgeons were not men of much importance, and probably had very little influence, if any, in the conduct of campaigns. But in the latter part of last century war was made on a scale which was never known before, and was made also with a rapidity and a precision quite unprecedented. Moreover, the science and art of surgery had been rescued from quackery, and surgeons in actual practice were able to be of great and real service to the wounded. As a result of the vast masses of men that were hurled against each other, the number of wounded after a big battle amounted to thousands, and civilization had so far advanced that it was imperative that immediate help should be given to them. So that about this time the military surgeon really became an important officer in warfare, and began to have his rank and pay well defined, and his merits (up to a certain point) recognized.

In 1776, near the Pyrenees, was born Jean Dominique Larrey, the Chirurgien-en-Chef de la Grande Armée, the friend and body surgeon of Napoleon, the greatest military surgeon that ever lived. He studied at the medical school of Toulouse, and in 1792 joined the head-quarters of the Republican Army of the Rhine under Custine. Now, the ambulances of these days were obliged to remain about a league from the army, and the wounded were only picked up after the fighting was done. General Custine was a man who moved his troops very rapidly, which made matters worse for the wounded. This greatly affected Larrey, who set to work and devised a new ambulance hung on springs, and combining great strength and lightness. Such carriages were termed *ambulances volantes*. They could keep up with the advanced guard of the army with the speed of flying artillery, and they carried off the wounded almost as they fell. Larrey had early perceived the enormous advantage a wounded man got by having

his fracture set or his bleeding stopped as rapidly as possible, and by then getting a roof over his head before night set in. General Beauharnais, in a despatch to the Convention, made special mention of "Surgeon-Major Larrey and his comrades with flying ambulances, whose indefatigable care in the healing of the wounded has diminished those afflicting results to humanity which have generally been inseparable from days of victory, and has essentially served the cause of humanity itself in preserving the brave defenders of our country." The staff of a flying ambulance was about 340 in number. For each division there were four heavy carriages and twelve light ones. Some had two and others four wheels, and they were furnished with mattresses. In Napoleon's Italian campaigns they came greatly to the fore, and the great man displayed a lively interest in them, reviewing them and causing them to maneuvre before him just as if they were on a battle-field. After one of these inspections he said to Larrey, "Your work is one of the most happy conceptions of our age. It will suffice for your reputation."

When Napoleon undertook his Egyptian campaign Larrey proceeded to Toulon to organize the medical staff. So readily did professional men respond to the call made by him that he soon was able to reckon on 800 well-qualified surgeons, of whom many had served in the army of Italy, and these were in addition to the medical officers actually attached to regiments. This, I think, shows the value that the king of commanders set upon the health of his troops, and the trouble and expense which he was prepared to face in order to maintain it—a great contrast to the miserable way of dealing with this subject which has too long been the fashion with our military rulers. Not long after the landing at Alexandria a certain General Figuières was severely wounded. By able treatment he recovered, and in gratitude for the preservation of his life he asked Napoleon to accept a valuable Damascus sword. "Yes," said the latter, "I accept it in order to make a present of it to the surgeon-in-chief, by whose exertions your life has been spared." Upon the sword were engraved the words Aboukir and Larrey, and the surgeon had it till the fatal day of Waterloo, when the Prussians robbed him of it. Some months after the occupation of Egypt a terrible revolt took place in Cairo by fanatical Turks. Utterly regardless of anything except how to get at Frenchmen to murder them, they attacked the hospital, which was crowded with sick and wounded soldiers, but the doctors valiantly defended their patients, and two staff surgeons, Roussel and Monjin, were killed, while Larrey nearly shared the same fate.

At one period there was a total dearth of meat, and Larrey had nothing wherewith to make even a drop of bouillon for his patients. He ordered camel's meat to be prepared for this purpose, and, when that fell short, he used up the horses. Years afterwards, in the second campaign against Austria, the Imperial Guard and several corps were crowded together in the island of Loban in the midst of the Danube, which Napoleon

was endeavoring to cross. The days were roasting, and the nights icy cold, and provisions became so scarce that Larrey's patients were in danger of starvation. Without more ado he impounded certain officers' horses and had them slaughtered and employed as food. As there was a lack of kettles, he employed the cuirasses of those who had been killed, and make his horse-flesh soup and stews in them. Certain generals made bitter complaint to the emperor of Larrey's proceedings, who summoned the surgeon-in-chief, and in the presence of his staff demanded an explanation with a severe expression of countenance. "What," he said, "have you on your own responsibility disposed of the horses of the officers in order to give soup to your wounded?" "Yes," answered Larrey. He added no more, but soon afterwards he heard of his promotion to the rank of baron of the empire.

One of the most appalling retreats, next to that from Moscow, was Napoleon's retreat from the invincible walls of St. Jean d'Arc through Jaffa. There is no doubt that at that place a considerable number of patients sick of the plague were quietly put out of their misery by opium. Allison says 60; Sir Robert Wilson says 580. The retreat had to go on, the Turks were only an hour's march behind, and nothing but a cruel death awaited these unfortunates, so that whether this were a justifiable deed or not may well give ground for argument. But, as Allison says, "History must record with admiration the answer of the French chief of the medical staff when the proposal was made by Napoleon to him: 'My vocation is to prolong life, and not to extinguish it.'"

In those days means of transport were so inferior, and the necessity for removing hopelessly damaged limbs as soon as possible after the injury so imperative, that amputations were performed on the field of battle, while it was still raging and amid showers of bullets. During the battle produced by the landing of the English in Aboukir Bay, General Silly had his knee crushed by a bullet. Larrey saw that unless the leg were promptly amputated the case would prove fatal, and, the general giving his consent, the operation was performed in the space of three minutes under the enemy's fire. Just then the English cavalry came upon them. "I had scarcely time," said Larrey, "to take the wounded officer on my shoulders and to carry him rapidly away towards our army, which was in full retreat. I spied a series of ditches, some of them hedges with caper bushes, across which I passed, while the enemy, owing to the ground being so cut up, had to go by a more circuitous route. Thus I had the happiness to reach the rear guard of our army before this corps of dragoons. At length I arrived at Alexandria with this honorably wounded officer, where I completed his cure." We must all agree that these were a pair of heroes.

As may be imagined, the awful retreat from Moscow called into play all Larrey's resources, and many an interesting story could be told of his efforts. Think of the awful battle of the Borodino, where under Larrey's

own direction 200 amputations were performed, where there were neither couches nor blankets nor covering of any kind, and where the food consisted of horse-flesh, cabbage-stalks, and a few potatoes; think of cold so intense that the instruments requisite for the operation too often tumbled from the powerless hands of the French surgeons. Think of the savage Cossacks, hovering about all the while, and waiting their chance to kill the surgeon and wounded man equally with the combatant. Then came the passage of the Beresina. Take an incident of it. Among the wounded was General Zayonchek, who was over sixty years of age. His knee was crushed, and without amputation the saving of his life was impossible. It was performed under the enemy's fire and amid thick-falling snow. There was no shelter except a cloak, which two officers held over him while the operation was being performed; but the surgeons did their work with such coolness and dexterity that the old general survived, and died fourteen years afterwards Viceroy of Poland. Larrey succeeded in getting over the Beresina with the Imperial Guard, but discovered that the requisités for the sick and wounded had been left on the other side. At once he recrossed the river, only to find himself in the midst of a furious struggling crowd. He was on the point of being crushed to death when providentially the soldiers recognized him. No sooner did they do so than they carried him across the river in their arms, with the cry, "Let us save him who saved us!" and forgot their own safety in their desire to preserve the man whose tender kindness they had so often experienced.

Following his adored master through victory and defeat, Larrey at last stood at night on the field of Waterloo alone, except for some medical officers and the wounded who lay groaning around him. Down upon them came a squadron of Prussian lancers. Expecting no quarter he fired his pistols at them and galloped away. They shot his horse and sabred him as he lay on the ground. Leaving him apparently dead they went off. But he recovered his senses, and tried to crawl by cross-roads into France. Again he was seized by another detachment of Prussian cavalry. They robbed him promptly of all he possessed, and took him before a superior officer, who ordered him to be shot. What a reward from a soldier to one whose life had been passed in succoring soldiers! About a quarter of an hour before the sentence was to be carried out, a surgeon-major recognized Larrey. He had attended with deep interest a course of lectures which Larrey had delivered in Berlin six years previously. The prisoner was brought before Bulow, and finally presented to Blücher, whose son in the Austrian campaign had been badly wounded and captured by the French, and who owed his life to Larrey's exertions.

Larrey's honorable and glorious life terminated in 1842. Napoleon, when he made his will at St. Helena, wrote in it, "I bequeath to the Surgeon-in-Chief of the French Army, Larrey, 100,000 francs. He is the most virtuous man I have ever known." From Napoleon's lips the words of free, spontaneous, ungrudging praise such as this rarely fell.

Pestilence more Deadly than the Sword.—In the middle of last century, while surgery had distinctly improved, the gross neglect of the government and the pigheaded obstinacy of the generals was such that our unfortunate soldiers and sailors were hardly any better off than they were in the days of Paré. It has been maintained that Smollett, in the appalling picture of naval life as witnessed in the miserable expedition to Carthagena which he drew in "Roderick Random," and which is known to have been the record of his own experience as a surgeon's mate, grossly exaggerated the evils thereof. I do not believe this. Look at the awful and unsuccessful expedition to Porto Bello in 1726, when nearly the whole of the crews of the ships were destroyed by fever three times over; where two admirals, ten captains, fifty lieutenants, and about 3000 to 4000 inferior officers and men perished without striking a blow. Look at the taking of Havana in 1762. The Earl of Albemarle took with him in the fleet 11,000 soldiers. Between June and the middle of October, when Cuba was ours, we had lost 560 by wounds, and 4708 by sickness. At the end of the Seven Years' War, a statement was drawn up in the "Annual Register" for 1763, from which it appeared that in all the naval battles of that war there were but 1512 sailors and marines killed, while 133,738 had died of disease or were "missing." Look even at the end of last century and consider the wretched and disgraceful Walcheren campaign. Never did our poor soldiers fight with more gallantry than in that campaign, only to perish beside Dutch ditches and canals from fever and ague and dysentery.

Military Courage.—As we have just seen, Baron Larrey's whole life shows that, while absolutely devoted to the work of his profession, he displayed a cool courage on the field of battle not less heroic than the dazzling deeds of his fellow combatant officers. Not less does it mark the military surgeon of the present day. Have you ever heard of Surgeon Thomson, who, during the Crimean war, when the army marched off after the battle of the Alma, volunteered, with his servant, John McGrath, to remain behind on the open field with 500 terribly wounded Russians, and passed three awful days and nights—these two Englishmen alone—among foreign foes, some dead, some dying, and none able to raise a hand to help themselves? Have you ever heard of Assistant-Surgeon Wolesley, of the 20th Regiment, who, at the battle of Inkerman, had quietly established his field hospital in that awful place, the Sandbag Battery? When the 150 men, who were all that remained of its defenders, were forced to desert it, about 100 of them fell back in one direction, and in that they found, at thirty paces from them, a Russian battalion blocking their path. There was not a combatant officer left, so the assistant-surgeon took command. He had not even a sword with him, but, laying hold of a firelock with a fixed bayonet on it, he spoke a few words to the men within range of his voice, and told them that what they now had to fight for was not victory but life. Then he gave them the word of command: "Fix bayonets,

charge, and keep up the hill." The soldiers answered him with a burst of hurrahs, sprang forward to the charge, and the next instant were tearing through the thickest of the Russians. One-half of these reached the other side alive. Have you ever heard of Surgeon Landon, who was shot through the spine while attending to the wounded on Majuba Hill? His legs were paralyzed, but he caused himself to be propped up, and continued his merciful work till his strength ebbed away. When unable to do more he quietly said, "I am dying; do what you can for the wounded." Have you ever heard of Surgeon-Captain Whitchurch, who gained the Victoria Cross at the beleaguering of Chitral for the most determined courage in endeavoring to save the life of Major Baird; yes, you have, for last year at Carlisle you gave him the gold medal of the Association, the highest honor which our Association can give to its members. There died the other day a certain Surgeon-General Reade, C.B., V.C. During the siege of Delhi, while attending to the wounded at the end of one of the streets of the city, a party of rebels advanced from the direction of the bank and, having established themselves in the houses in the street, commenced firing from the roofs. The wounded were thus in very great danger, and would have fallen into the hands of the enemy had not Surgeon Reade drawn his sword and, calling upon a few soldiers who were near, to follow, succeeded under a very heavy fire in dislodging the rebels from their position. Surgeon Reade's party consisted of about ten in all, of whom two were killed and five or six wounded. Ladies and gentlemen, Surgeon Reade was a Canadian, and the son of a colonel of the Canadian Militia. Of the 118 wearers of the Victoria Cross, 14 are surgeons, nearly 12 per cent. of the whole number. They stand in the proportion of $9\frac{1}{2}$ per cent. of all the officers of the army, so at all events they have contributed not less than their fair share of the deeds of valor which alone can win that glorious distinction.

The Army Medical Service of To-day.—Ladies and gentlemen, I have diverged from the beaten track common to the givers of addresses such as this to tell you what splendid men have been the military and naval surgeons of old, who merely did their duty nobly and courageously as such, but who have in their day enormously contributed to the advance of the art of surgery. I have done it with a purpose; with the hope of attracting more strongly than ever the sympathy and help of this great Association to their military brethren in a critical juncture of their history. To-day Her Majesty's government cannot induce candidates to come forward for the medical service of the queen's army. And why? Because it has persistently treated the Army Medical Department meanly and shabbily. To-day the government of India can secure the services of the pick of our newly fledged doctors for its army. And why? Because it has always treated the Indian Medical Service liberally and generously. I am not going to enter into the reasons for this. I desire to emphasize one point, namely, that money is not at the bottom of this difficulty. The

soldier surgeons of to-day are the same men now that they were in the days of William Clowes, who winds up his book, as I shall my address, with these verses:

When valiant Mars, with brave and warlike band,
In foughten field with sword and shield doth stand,
May there be mist a surgeon that is good,
To salve your wounds and eke to stay your bloud.

To cure you sure he will have watchful eie,
And with such wights he means to live and die,
So that againe you must augment his store,
And having this he will request no more.[1]

ADDRESS ON PUBLIC MEDICINE DELIVERED BEFORE THE BRITISH MEDICAL ASSOCIATION AT MONTREAL, SEPTEMBER 3, 1897.

BY HERMAN M. BIGGS, M.D.,

Director of the Bacteriological Laboratory of the Health Department, New York City.

I DESIRE to express my high appreciation of the honor conferred upon me by the invitation of the Council of the British Medical Association to deliver the address on Public Medicine at its annual meeting, and for this I wish to render my grateful acknowledgment.

I interpret the invitation, however, as a tribute to the work of the Health Department of New York city, with which I have had the honor to be connected for many years, and as an expression of the desire of the Council to give recognition to the practical advances made in sanitary science in the greatest city in the New World. I have, therefore, regarded your invitation as a command to select for the subject for this address the consideration of some of the measures which have more particularly distinguished the work of the New York City Health Department, and to describe some of the procedures, followed in the sanitary surveillance of infectious diseases, which have been introduced by it.

I feel a great diffidence in presenting an address dealing with these

[1] At the conclusion of his address Mr. Mitchell Banks exhibited, by the lantern, a series of pictures illustrating many of the historical points raised during his address. These were taken from such authors as Delle Croce, Abucasis, Marcus Aurelius, Jerome of Brunswick, Hildanus, Woodall, and others. Portraits of Paré, Peter Lowe, and Wiseman were shown, and representations of ancient surgical instruments. The reduction of dislocations and the putting up of fractures were illustrated also. Then came pictures which showed how amputations were performed and cauterizations and trephinings done. Finally the last two pictures represented the military surgeon of the middle of the sixteenth century actually engaged in the treatment of wounds on the battle-field. The photographs were from plates in books belonging to Mr. Banks, and illustrated the costumes of the period from about 1530 to 1570.

subjects before the British Medical Association, representing, as it does, the medical profession, and, to a great extent, the health officers of a country which has been so long and justly regarded as the birthplace and home of sanitary science. It has been the custom of sanitarians of all nations to look to England for guidance and direction in matters connected with the public health, and the low mortality statistics, especially from zymotic diseases, in England testify in no uncertain language to the value of English sanitary methods and the efficiency of their execution. When we remember that never before in the world's history have there been 30,000,000 people living within 50,000 square miles, as is the case in England, and that more than 20,000,000 of this population reside in towns, often crowded, we appreciate more fully the remarkable healthfulness of the England of to-day and the extraordinary success of English sanitation, as of English methods in all the practical affairs of life.

The fact should be strongly emphasized that the advances in preventive medicine in Great Britain, as shown by the mortality tables for nearly half a century, have preceded those in every other country, and I doubt not that the influence of the British Medical Association has been no small factor in contributing to the high standard of the public health. In view of these considerations, it is natural that a foreigner should hesitate to address this Association on questions connected with public medicine.

I must further ask your indulgence in having devoted the greater part of this address to the study and description of procedures and methods, rather than, as is generally the custom, to the consideration of some one of the broader questions in public medicine. This course has been adopted because, in my judgment, such a discussion will be of greater value and interest than the consideration of any general topic, which latter could furnish little specific information as to the conditions and methods of sanitary work in the United States.

It seems necessary, in order that you may have an intelligent conception of the conditions under which sanitary work in the United States is carried on, that I should first point out, in a general way, how they differ from those in Great Britain. It should be noted particularly that in the United States there is no national board of health, and there are no national regulations of general application. In each of the several States of the Union the sanitary administration is solely under the control of the State authorities. The State Boards of Health are energetic and progressive in many of the States, but in some there is no sanitary work of importance done.

It necessarily follows that throughout the United States there is a great lack of uniformity in regulations and methods and in the efficiency of their execution. It is hardly possible to make any definite statement as to the condition of preventive medicine generally, for what is true of one State is not true of another. Speaking broadly, in the rural districts and in the towns and smaller cities, especially in the South and West, the

sanitary methods are of the crudest type. On the other hand, in many of the larger cities, there is found a broad, enlightened, and progressive policy and an efficient administration, equal to that presented in any of the great cities of the world.

Instead, therefore, of attempting the consideration of the broader subject of public medicine in the United States, I shall confine myself to a discussion of the conditions and methods of sanitary work in New York, as these serve as a type of the best of those found in the greater American cities.

The Health Department of New York city is organized under a special act of the Legislature of New York State, and is an entirely independent sanitary organization, not being subject even to the jurisdiction of the State Board of Health. The Board of Health of the Health Department is composed of four members,—viz., the President, who is the chief executive officer; the Commissioner of Health, who must be a physician (these two being appointed by the Mayor of New York city), and two *ex-officio* members—the Health Officer of the Port of New York (who is a State officer nominated by the Governor), and the President of the Board of Police Commissioners of New York city (the latter being added to bring the Police Department and the Health Department in closer relations to one another). The Commissioner of Health of the Health Board of New York city is, *ex-officio*, a member of the State Board of Health, as is also the Health Officer of the Port of New York; so that two of the members of the Municipal Board are also members of the State Board of Health, but the State Board has no jurisdiction in New York city, and the action of the Municipal Board is absolutely independent.

The Board of Health of New York city has jurisdiction over the whole of New York city, as it now exists, with its population of about 2,000,000, and with the beginning of 1898 a similar board, increased to five members, will have complete jurisdiction over greater New York, with a population of about 3,250,000. All of the administrative and executive work of the Department is concentrated at the main offices, and is carried on under the immediate direction of the chiefs of the various divisions into which the Department is divided. The act of the Legislature of New York State creating the Department gives to the Board most ample powers, executive, judicial, and legislative in character. The funds for the support of the Department are supplied from the general funds of New York city.

Before proceeding to a discussion of the management of infectious diseases in New York, I desire to call especial attention to the fact, that all matters connected with the scientific investigation, diagnosis, care, or sanitary supervision, in every way, of the infectious diseases are regarded by the Board of Health as properly coming within its province. In the development of the methods now in use, the proposition expressed has furnished the governing principle. I need hardly point out the great differ-

ence between this conception of the functions of a sanitary board and that usually held.

The duties of sanitary authorities relating to the infectious diseases are generally regarded as limited to the inspection of reported cases of only a few of the infectious diseases, their removal to hospitals when required, and the subsequent proper disinfection of the premises.

In times of emergency, as in the presence of serious epidemics, more comprehensive and stringent measures are considered justifiable; but it has not been generally regarded as necessary or desirable that municipal sanitary authorities should furnish opportunities for or assistance in the diagnosis of infectious diseases, should conduct experimental investigations into their causes, should assist in the treatment in any way of cases outside the hospitals, or otherwise concern themselves with these matters. It has seemed to us in New York city, however, that everything connected with the infectious diseases in every form came properly within the scope of the Department's work.

The first important departure in New York city from the older methods was made in 1892 by the establishment of a bacteriological laboratory. This was, I believe, the first bacteriological laboratory ever established under municipal control. It was designed originally to afford facilities for the bacteriological diagnosis of the Asiatic cholera, and for the investigation of questions relating to disinfection and disinfectants. A few months after the opening of the laboratory, the scope of its work was broadened and facilities for the bacteriological diagnosis of diphtheria were offered to the physicians of New York city free of charge. The necessity for making repeated examinations during the course of this disease soon became evident, and such changes were made by the health authorities in the methods of dealing with diphtheria as were suggested by the earlier experimental observations.

The investigations of the New York City Health Department relating to diphtheria laid the foundation of municipal bacteriological laboratories and made them necessary to the proper conduct of sanitary work.

The work on diphtheria was soon followed by the perfecting of arrangements for the free bacteriological examination of sputum for the diagnosis of cases of suspected tuberculosis occurring among residents of New York city.

In October, 1894, investigations in connection with the production of diphtheria antitoxin were begun, and in December of that year the municipal authorities made a special annual appropriation (antitoxin fund) of $30,500 for the prosecution of this work. The Health Department commenced the use of the antitoxin produced in its own laboratories on January 1, 1895. The plan, as now developed, includes:

1. The furnishing of free supplies of diphtheria antitoxin to all public institutions in New York city.

2. The furnishing of free supplies of diphtheria antitoxin to private

physicians for use among persons too poor to pay for the remedy; the only condition being that reports of the cases treated be forwarded to the Health Department on their completion.

3. The free administration of diphtheria antitoxin, on the request of the attending physician, to any resident of New York City, by a specially detailed staff of medical inspectors.

The sale of the surplus product of diphtheria antitoxin was authorized by a special act of the New York State Legislature in 1895, and the funds thus derived, according to the provisions of this act, are devoted solely to "the production and use of diphtheria antitoxin or other antitoxins." The remedy is on sale in over 100 pharmacies in the city, to which it is consigned, the price being fixed by the Health Department in all cases, and ten per cent. on the sales is allowed to the pharmacies as commission.

The special antitoxin fund made possible the establishment of a hospital and research bacteriological laboratory devoted to the production of diphtheria antitoxin and other bacteriological products and to general experimental investigations in relation to the infectious diseases. The work of this laboratory now includes the production of tetanus and streptococcus serums, mallein and tuberculin (used by the Department in the diagnosis respectively of glanders and tuberculosis in animals), and numerous experimental investigations regarding the infectious diseases, especially diphtheria, typhoid fever, tuberculosis, and small-pox.

In October, 1896, arrangements were completed for placing at the command of the physicians of New York city Widal's test for the diagnosis of typhoid fever, largely after the method of Wyatt Johnston, of Montreal, and recently arrangements have also been made for the administration of Pasteur's treatment for the prevention of rabies.

A better idea, perhaps, of the extent of the work performed in the laboratories of the Health Department of New York city may be obtained from the following statistical statement of some of the routine work:

During the year 1896, 25,049 cultures were examined for diphtheria bacilli; 1856 specimens of sputum from cases of suspected tuberculosis were examined for tubercle bacilli; 16,796 vials of diphtheria antitoxin were issued, 818 cases of diphtheria were treated in their homes by the medical *attachés* of the laboratory, and 1214 persons were immunized.

The scientific staff of the bacteriological and vaccine laboratories now includes twenty-five physicians, one chemist, and two veterinarians, in addition to clerical and laboratory assistants and attendants.

A special laboratory and stable are devoted to the production of bovine vaccine virus, and this is freely distributed and vaccination is performed free of charge by the medical officers of the Department. Special investigations undertaken in this laboratory have resulted in the production of glycerinated vaccine pulp of great activity and durability. This has entirely displaced the viris prepared by drying on quills or ivory points generally employed.

The work connected with disinfection was formerly in charge of the Director of the Bacteriological Laboratories, and the methods employed are still determined in the laboratories, but the details of execution however, are now entrusted to the Chief Inspector of Contagious Diseases.

Every case of contagious disease reported to the Department is regularly inspected by the medical inspector assigned to the district in which it occurs. When consent can be obtained, such cases are removed to the department hospitals. In tenement-house districts an effort is made to induce a patient suffering with a contagious disease to go to the hospital, and where the conditions are such as to require it, and when necessary, the removal to the hospital is enforced. A comparatively small proportion of the total cases, however, are actually treated in the hospitals for contagious diseases. After completion of the illness, or transfer of the patient, thorough disinfection is performed in the apartment and all infected materials are removed to the disinfection station for destruction, or for disinfection by steam. After treatment they are returned to the owner, no charge being made for the services. Disinfection is compulsory in every case.

The inspection work of the Health Department is carried on by a number of different corps of inspectors attached to the various divisions of the Department. These inspectors are in part medical men, and in part they are non-medical men who have had special training in the work to which they are detailed. The medical corps include the district medical inspectors, the district and special vaccinators, the inspectors for the administration of diphtheria antitoxin, the diagnosticians, the summer corps of inspectors, the medical inspectors of schools, the veterinary inspectors, and several special inspectors of disinfection of lodging houses and public institutions. These various corps, with the exception of the summer corps and the school inspectors, are permanent and are on duty throughout the year. The school inspectors are on duty only through the school year, and the work of the summer corps is limited to July and August. There are also a number of corps of sanitary and food inspectors (not necessarily medical men) and the disinfection corps. These include the inspectors of plumbing and ventilation, the sanitary police, the inspectors of offensive trades, the inspectors of meat, fish, milk, and food, and the inspectors of mercantile establishments.

The functions of most of these different corps are, for our purpose, sufficiently indicated by the name. It may be here added, however, that, under the law creating the corps of inspectors of mercantile establishments, definite provisions are made as to employment of women and children in such establishments, and as to the time, nature, and condition of such employment.

It should, perhaps, also be stated that the function of the diagnosticians, two of whom are always on duty day and night, is to give expert assistance in the *clinical* diagnosis of contagious diseases. It is a part of their duty to see every case of contagious disease before its admission to the department hospitals.

The veterinary inspectors have supervision of the application of the tuberculin test for the diagnosis of tuberculosis in cattle and the diagnosis of other infectious diseases of cattle and horses.

I desire now to present somewhat in detail the methods of procedure in relation to two diseases, viz., diphtheria and tuberculosis, as in these diseases the methods have been developed to an unusual extent in New York.

Knowledge of the existence of cases of diphtheria reaches the Department, either by a direct report of the case by the attending physician, or through the forwarding of a culture to the laboratory for bacteriological examination when the case is of doubtful character. If on examination of the culture the Loeffler bacilli are found, the case is reported to the Division of Contagious Diseases from the laboratories, at the same time that a report is forwarded to the attending physician. In both instances the cases are immediately referred to the Medical Inspector connected with the Division of Contagious Diseases assigned to the district in which the case occurred. If the person lives in a tenement house, lodging house, boarding house, or hotel, and a culture has not been previously made by the attending physician, the inspector makes, in each instance, a culture to confirm the diagnosis. The subsequent action of the Department depends upon the result of this culture. If diphtheria bacilli are found, the case is treated as one of diphtheria; if they are absent, the subsequent treatment depends on the special conditions existing. In every instance in which the case is proven to be diphtheria, at the end of ten days a secondary culture is made by the attending physician or the District Medical Inspector, to determine whether the diphtheria bacilli are still present in the throat, and subsequent cultures are made at short intervals until the examinations show that the organisms are no longer present. The case is then referred for disinfection, a detailed statement being left at the house by the Medical Inspector in charge, to guide the disinfectors as to the course which shall be followed.

Every case of diphtheria which comes to the knowledge of the Department is recorded in a card index, according to the number of the house and the street on which it occurs. In this index envelops are used in place of cards, and in each envelop, representing always one case, are placed all of the data relating to the first and subsequent cultures, and results, and as each case is recorded it is at the same time platted on a sectional map of New York city drawn to scale, showing every house lot in the city. This platting is done by conventional signs, so that it is possible at a glance to determine the grouping and distribution of cases in different parts of the city, the number of cases occurring in any given house in the city during the last four years since this method has been in use, and the date when reported. It is also possible in a moment, by reference to the yearly card index, to find all the information in relation to each case which the Department possesses.

A special corps of inspectors is assigned to the administration of diphtheria antitoxin, and on request one of these inspectors will visit a person suffering from diphtheria in any part of the city, day or night, and administer diphtheria antitoxin, under the supervision of the attending physician. When the patients are too poor to have an attending physician, the inspectors will supervise their removal to the hospitals. These inspectors are also prepared, at the request of the attending physician, to perform intubation in laryngeal diphtheria. It is the usual course, where antitoxin is administered by an inspector, to immunize all members of the family who have been exposed to the disease. Diphtheria antitoxin has also been largely employed for the immunization of the inmates of public institutions, especially children, when diphtheria has appeared. This is the ordinary routine, and in every instance during the last two and a half years it has been possible to quickly stamp out diphtheria in institutions by this process of immunization.

As already stated, diphtheria antitoxin is furnished on request free of charge to all public institutions, and may be obtained by physicians at any of the 100 depots where it is on sale, free of charge, for administration to persons who are too poor to pay for the remedy.

In connection with the study of diphtheria, experimental investigations are constantly being carried on to determine the virulence of the diphtheria bacilli found in healthy throats, in simple catarrhal angina, and in follicular tonsillitis, and regarding the various matters which relate to the bacteriological study of this disease.

The attitude assumed by the Health Department of New York city towards pulmonary tuberculosis, and the measures adopted for its prevention, constitute, in my opinion, a most important feature of its work. No more striking example of the influence of inherited and transmitted beliefs and prejudices can be found than is afforded by the exhibition of hesitation and reluctance on the part of the proper authorities to assume the sanitary supervision of the tubercular diseases. It is now universally admitted that tuberculosis is infectious and communicable, and the most fatal disease to which the human race is subjected; yet, as a rule, no effective measures, or no measures at all, have been adopted by sanitary authorities with relation to it. Nevertheless, we believe it may be more easily controlled than any other of the principal infectious diseases with which we have to deal, and that it is of as great importance—judged by the deaths it causes—as all the others together. The full courage of scientific conviction seems to have been generally lacking among public officers in dealing with this disease.

The Health Board of New York City first began an educational campaign in relation to the causation and prevention of pulmonary tuberculosis in 1889. In that year a communication on this subject, presented by the writer and the associated Consulting Pathologists of the Department, was widely published, and leaflets, based on it, giving the essential facts as

to the nature of this disease, were freely distributed. No further action was taken at that time, as investigation showed that the medical profession and the public were not then prepared for more extended measures.

In December, 1893, the attention of the Department was again called to the subject by the writer, and it was determined at once to institute more comprehensive measures for the prevention of this disease. The measures then adopted required the notification of all cases of pulmonary tuberculosis occurring in public institutions, and requested reports of cases occurring in the practice of private physicians. They also included arrangements for the bacteriological examination of sputum, to assist in the early diagnosis of this disease; the inspection of all reported cases in tenement houses, lodging houses, hotels, and boarding houses, and the instruction of the patients and their families as to the nature of the disease and means to be taken for its prevention; the inspection of the premises in all instances where deaths were reported as due to tuberculosis, and the issuing of orders, when it was deemed necessary, upon the owners of apartments which had been occupied by consumptives and vacated by death or removal, requiring that such apartments be thoroughly renovated, by cleaning and by painting, papering, or calcimining, before they were again occupied by other persons; and finally the education of the public, by wider and more comprehensive methods, as to the nature of this disease.

Placards were attached to the doors to prevent the re-occupation of apartments which had been vacated by death or removal before the orders requiring renovation had been complied with.

Under the resolutions by virtue of which these measures were enforced, 4166 cases of tuberculosis were reported in 1894; 5818 in 1895, and 8334 in 1896. So far as was possible all of these cases, except those in private houses, were visited or the premises where they had lived were inspected, and, in addition, the premises occupied by persons dying from tuberculosis (numbering each year nearly 6000) were inspected and such action taken as was considered possible and desirable. Altogether the premises and cases thus coming under observation during these three years numbered more than 35,000.

These facts convey some idea of the enormous sanitary importance of the subject. It is conservatively estimated that there are at least 20,000 cases of well developed and recognized pulmonary tuberculosis now in New York city, and an additional large number of obscure and incipient forms of the disease. A very large proportion of the former cases constitute more or less dangerous centres of infection, the degree of danger depending in each instance upon the intelligence and care which are exercised in the destruction of the expectoration. All the suffering and death consequent upon the prevalence of this disease, in view of modern scientific knowledge, is largely preventable by the careful observation of simple, well understood, and easily applied measures of cleanliness, disinfection, and isolation.

In the beginning of 1897, the Health Board further adopted some recommendations made jointly by Dr. T. Mitchell Prudden, Consulting Bacteriologist to the Health Department, and the writer, which advised that pulmonary tuberculosis be declared to be "an infectious and communicable disease, dangerous to the public health," and which required "the notification of all cases occurring in the city," in the same way as is required in regard to typhoid fever, diphtheria, and other similar diseases. Tuberculosis, however, in accordance with the special section of the Sanitary Code, enacted to provide for these measures, is distinctly separated from the eruptive diseases—is not classed with them as a contagious disease, but is referred to as "an infectious and communicative disease." It has always appeared to the Health Board exceedingly desirable that a broad distinction should exist in the public mind between this disease and those diseases which are more properly classed as contagious.

In the treatment of apartments which have been occupied by tubercular patients and vacated by death or removal, renovation has been and is ordered, rather than disinfection attempted, because the Health Board has always felt that disinfection for tuberculosis in the poorest tenement houses was too difficult to be satisfactorily performed, and has considered renovation as certainly efficient. In the thousands of orders requiring the renovation of premises, which have been issued under the resolution referred to upon the owners of real property during the last four years, little or no difficulty has been experienced in enforcing compliance, and rarely has there been serious objection.

Public institutions, hospitals, asylums, homes, etc., are now not only required to report the name, last address, sex, age, and occupation of every case of tuberculosis coming under observation within one week of such time, but they are further required to notify the Department of the discharge or transfer of such patients. The purpose of this procedure is to keep under more or less constant supervision those cases of pulmonary tuberculosis which occur among the poorest classes of the population; in other words, those which are most likely to be dangerous sources of infection to others. Unfortunately, at the present time there are no hospitals, directly under the control of the Health Department, for the care or isolation of cases of pulmonary tuberculosis; but it is hoped that such hospitals may be soon provided.

The best medical opinion forbids that persons suffering from pulmonary tuberculosis be treated in association with other classes of cases in the general medical wards of general hospitals. This opinion is based on the daily observation of dangers incident thereto, and it has very properly resulted in the exclusion, to a large extent, of persons suffering from this disease from many of the general hospitals to which they were formerly admitted.

A large experience has also shown that in institutions devoted solely to the care of consumptives the general welfare of the patients is more easily fostered, and risks of fresh infection more certainly diminished and the

chances for recovery more surely enhanced, than in general hospitals in which all classes of cases are received.

From the beginning of this work, the officials of the Health Department of New York city have encountered, in the lack of proper facilities for the care of consumptives, a great obstacle to practical success, and I am convinced that the grave responsibilities which rest upon sanitary authorities generally in this matter cannot be properly discharged without the establishment, under their direct control, of additional special hospitals for the care and treatment of this disease. No week passes in which the officers detailed in this work in New York do not encounter many instances in which the members of many households, numerous inmates of crowded tenement houses, employees in dusty and unventilated workshops, and many others, are dangerously exposed to infection from victims of this disease, who cannot gain admittance to the overcrowded public institutions, or who reject all proffered assistance and instruction, and, from ignorance, indifference, or inability, through weakness due to the disease, scatter infectious material broadcast, thus diminishing their own chances for recovery and imperilling the health and safety of others. In such cases sanitary suggestions are futile, and removal to a hospital constitutes the only effective action. I am convinced that no factor is so potent to-day in perpetuating the ominous death list from pulmonary tuberculosis as the lack of proper facilities for the adequate care of the poor stricken with this malady.

The measures designed for the prevention of tuberculosis properly include not only those which relate to the transmission of the disease from human beings to each other, but also those which relate to the transmission of the disease from affected animals, especially the bovine species, to human beings, through the meat and milk used as food. The Health Department of New York city, while feeling strongly that the most important source of infection is through the sputum of consumptives, has yet elaborated with great care methods for protecting the public, so far as lies within its power, from infection by the meat and milk of tubercular animals. In order that a more effective control of the milk supply should be possible, an ordinance was passed in 1895 forbidding the sale of milk within the city without a permit from the Health Department, and requiring that all wagons used for transportation or delivery of milk should likewise have wagon permits. Before these permits are issued, the holder of the permit must furnish information as to the source from which the milk is obtained, the number of animals, the character of the food supply, and the sanitary conditions surrounding the dairy. Special regulations have been established with regard to the sale of milk, and permits may be revoked at any time by the Health Board, where evidence exists that the regulations have not been strictly complied with. All milch cows in New York city (about three thousand in number), are now being subjected to the tuberculin test, under the supervision of the Health Department, and animals found to be diseased are killed. It is proposed, as soon as this work is completed in

New York city, to require similar tests to be applied to all cows whose milk is sent to New York city. There also exists a careful inspection of animals slaughtered for food, and of all meats sent into the city, and the carcasses of those found to be tubercular are destroyed.

Most beneficial effects have already resulted from the various measures instituted for the prevention of this terrible disease. Not only has there been a very material decline in the number of deaths occurring from it, but there has been a most gratifying increase of knowledge and intelligence as to its nature among the poorest class of the population. The inspectors detailed for this work report, that on their first inspection, in nearly one-half of the cases occurring in many parts of the tenement-house districts of the city, it is found that more or less efficient precautions are being taken for its prevention. Such precautions are the use of rags to receive the sputum, which are later burned, instead of handkerchiefs; the use of cups containing water or a disinfecting solution; the separation of the clothing of the patient from that belonging to others, and similar measures.

This increase of intelligence, and the precautions resulting from it, afford the greatest promise for the future, of a persistent and still more rapid decline in the frightful morbility and mortality caused by the tubercular diseases.

Investigations made by the Department, showing that the dust in the street cars and various public places is often infectious, led to the enactment of an amendment to the Sanitary Code prohibiting spitting on the floors of street cars, ferry boats, and other public conveyances, and requiring that all companies should post in their cars, boats, etc., printed notices forbidding this. This regulation is very difficult of enforcement; but, while the results have been by no means entirely satisfactory, there has yet been a definite improvement in the existing conditions.

The method employed for recording and plotting cases of diphtheria is also used for cases of tuberculosis.[1]

[1] Transcripts from the maps were shown on which were plotted the cases of diphtheria and tuberculosis in certain wards of the city. These wards have been selected in each instance because of the large number of cases of the respective diseases occurring in them. Maps 1 and 2 showed respectively the 4th and 6th wards, with the distribution of reported cases and deaths from tuberculosis in these wards during three years. The cases and deaths in 1894 were plotted with a circle; cases and deaths in 1895 with a triangle, and the cases and deaths in 1896 with a dagger. The dwelling houses in the maps were colored so as to put them in contrast with buildings not occupied as dwelling houses. The dwellings which had one or more cases of tuberculosis during this period were colored pink, and those free from tuberculosis during these years were colored blue. The plots which were left uncolored are not dwelling houses, but occupied as business buildings, warehouses, etc. These maps argue more forcibly for the infectious and communicable character of this disease than could any words. It should be said, however, that in some instances where a large number of cases have occurred in one house during these years, the house had been occupied as a Chinese lodging-house. This is especially true of several of the houses on Pell and Mott streets. Maps 3 and 4 show the distribution of cases of diphtheria for the same period in the 10th and 13th wards. These maps, as has been said, are simply transcripts, reduced in size, from the maps on which are plotted, day by day, the reported cases and deaths from these diseases throughout the city.

TABLE I.

ANALYSIS OF DISTRIBUTION OF REPORTED CASES AND DEATHS FROM TUBERCULOSIS IN 1894, 1895, 1896, TO MARCH, 1897.

WARD IV.

According to the census of 1896, there were 663 inhabited houses in Ward IV., with a population of 18,323, or an average number of 27.6 persons per house.

Number of houses in which cases occurred		248
Number of cases in 1894	173	
Number of cases in 1895	161	
Number of cases in 1896–97	207	
Total number of cases in 3 years		541
Average number of cases per infected house		2.81
Percentage of houses infected		37.3
Average number of cases per house in ward		0.81
Cases per 1000 population in 1894	9.4	
Cases per 1000 population in 1895	8.7	
Cases per 1000 population in 1896–97	11.2	
Total cases per 1000 population in 3 years		29.3

TABLE II.

WARD IV.

Houses showing 3 or more cases each of tuberculosis.

Number of houses in which 3 or more cases occurred		70
Number of cases in 1894	88	
Number of cases in 1895	95	
Number of cases in 1896–97	119	
Total number of cases in these houses in 3 years		302
Average number of cases per house		4.3

Comparing these figures with those obtained for the whole ward:

Total number of infected houses in Ward IV.	248
Number of houses in which 3 or more cases occurred	70
Percentage on total infected houses	28.2
Total number of cases in ward	541
Cases occurring in 28.2 per cent. of houses infected	302
Percentage of total cases	55.8
Total number of inhabited houses	663
Number of houses in which 55.8 per cent. of cases occurred	70
Percentage in total houses	10.5

It is thus seen that of the infected houses 28.2 per cent. contained 55.8 per cent. of the cases, and these occurred in only $10\frac{1}{2}$ per cent. of all the houses in Ward IV.

TABLE III.

WARD VI.

According to census of 1896, there were 630 inhabited houses in Ward VI., with a population of 22,897.

Number of houses in which cases occurred	239
Number of cases in 1894	157
Number of cases in 1895	127
Number of cases in 1896–97	191
Total number of cases in 3 years	465
Average number of cases per house	1.94
Total number of dwellings in ward	630
Number of houses infected with tuberculosis	239
Percentage of infected houses	37.9
Average number of cases per house in ward	0.72
Cases per 1000 population in 1894	6.8
Cases per 1000 population in 1895	5.5
Cases per 1000 population in 1896–97	8.2
Total number of cases per 1000 population in 3 years	20.5

TABLE IV.

WARD VI.

Houses showing 3 or more cases each of tuberculosis.

Number of houses in which 3 or more cases occurred	45
Number of cases in 1894	72
Number of cases in 1895	56
Number of cases in 1896–97	76
Total number of cases in these houses in 3 years	206
Average number of cases per house	4.5

Comparing these with the figures obtained for the whole ward:

Total number of infected houses	236
Number of houses in which 3 or more cases occurred	45
Percentage of total infected houses	18.0
Total number of cases in ward	465
Cases occurring in 18.9 per cent. of houses infected	206
Percentage of cases in same	44.3
Total number of inhabited houses	630
Number of houses in which 44.3 per cent. of cases occurred	45
Percentage in total houses	7.1

Thus 44.3 per cent. of the cases occurred in 18.9 per cent. of the infected houses, and these constituted only 7.1 per cent. of all the houses in Ward VI.

I desire now to refer briefly to the system of medical school inspection, instituted by the Health Department during the last year, which has given thus far most satisfactory results, and which promises greater good in the future.

Early in 1897, under the authority of a special resolution of the Board of Estimate, 150 Medical School Inspectors were appointed by the Health Board, after civil-service examination. The duties of these inspectors consist in the examination daily, at the opening of the primary and grammar departments of each of the public schools and of the parochial and industrial schools, of all the children who are set apart by the respective class-room teachers as not appearing to be entirely well. These children are examined in each school by the Inspector detailed to the school; and are either excluded from the school-room or returned to the class, depending on the result of the examination. Every pupil found to be suffering from any form of general contagious disease or any contagious disease of the eye or parasitic disease of the skin is sent home, with a written statement to the parents of the cause for the action, and in the case of the eruptive diseases and diphtheria, reports are immediately forwarded to the Chief Inspector of Contagious Diseases, and by him referred to the various District Medical Inspectors for inspection and supervision.

During three months (65 school days) in which this system has been in operation, there have been examined 63,812 children, who had been set aside by the teachers as not appearing entirely well, of which number 4183 were excluded for the following reasons:

Measles	88
Diphtheria	167
Scarlet fever	32
Croup	11
Whooping-cough	26
Mumps	117
Contagious eye diseases	702
Parasitic diseases of head	2,627
Parasitic diseases of body	108
Chicken-pox	130
Skin diseases	175
	4,183

The children excluded because they were thought to be suffering from measles, scarlet fever, diphtheria, and chicken-pox were afterwards seen by the Medical Inspector, and in the majority of cases the original diagnosis was confirmed.

The educational work of the Health Department is, I believe, of great importance. It has been the custom of the Department for some years past to issue from time to time circulars of information on various topics, and especially with relation to the infectious diseases, their diagnosis, treatment, or management. Some of these circulars are popular in character, very large editions being published, 50,000 or more at a time, and are designed for general distribution, particularly among the tenement-house population.

Examples of this class are the following: "Information for Consump-

tives and their Families," "Infant Feeding," "Methods of Transmission of Contagious Diseases," and numerous others on similar topics. Circulars of information are also issued which are designed for distribution among the medical profession. These relate to the work of the Health Department in connection with infectious diseases, or to the bacteriological products of the laboratories. Many such circulars have been issued on various topics connected with diphtheria, such as "Bacteriological Examinations for the Diagnosis of Diphtheria," "Relation of Membraneous Croup to Diphtheria," "Diphtheria Antitoxin," "Persistence of Diphtheria Bacilli in the Throat during Convalescence from Diphtheria," "Occurrence of Diphtheria Bacilli in Healthy Throats and in Catarrhal Angina," etc. Other circulars of information have been issued on "The Importance of Bacteriological Examinations in the Early Diagnosis of Pulmonary Tuberculosis," "The Nature and Causation of Pulmonary Tuberculosis," "The Measures adopted by the Board of Health for the Prevention and Restriction of Pulmonary Tuberculosis;" and on the use of "Mallein," "Tuberculin," "Tetanus Antitoxin," "Glycerinated Bovine Vaccine Virus," etc.

As these various circulars are published by the Health Department, copies of them are sent to the medical journals published in New York city and to the daily press. Thus they gain at once a wide circulation. In addition, some one or more of these circulars is included in each report of the results of the bacteriological examinations in diphtheria and tuberculosis, as they are sent from the laboratories. As more than one hundred reports daily are sent out, a large circulation is again attained among physicians in this manner. In some instances, circulars considered to be of unusual importance have been delivered by messenger to the house of every physician in New York city.

Aside from the circulars described, numerous scientific bulletins have been issued from time to time from the bacteriological laboratories, detailing the results of original investigations in connection with infectious diseases, and these bulletins are widely distributed among the profession of New York city.

I do not believe that the importance of this educational work can be over-estimated. Its value is incalculable in widely disseminating popular and scientific information with regard to the results of the latest studies in infectious diseases, and there have been constantly exhibited in New York the most gratifying indications of the influence of the information thus distributed, on both the general public and the medical profession.

More than this, the circulars kept constantly before the medical profession and the laity the work, the duties, and the functions of the Health Department, as related to the people and the profession.

It has been frequently urged, especially in the earlier work of the New York City Health Department, that the methods proposed were theoretically commendable enough, but that they were impracticable. This criticism has been often made, particularly in Europe. The best reply to it is,

that the results have shown that they are not impracticable. What has been described is not something that it is proposed to do, but it is a statement of what has been and is being done, and this work, as briefly outlined in some of its phases, is to be considered as only introductory.

It is the purpose of the Health Board to establish a supervision of all infectious diseases along the lines which have been thus far developed in relation to tuberculosis and diphtheria, as rapidly as the scientific knowledge at command will make such a course possible.

The final test of the efficiency of any scheme of sanitary control and of the healthfulness of any community or locality is found in the morbility and mortality statistics, considered in relation to the causes of sickness and death. It is not simply the number of deaths or cases of sickness in proportion to the population, but also the nature of the diseases which cause morbility and mortality.

In comparing the statistics for different localities, however, the special factors relating to each locality must be taken into consideration; for a death rate which would indicate unusually favorable conditions in a large city might show far more favorable conditions in a rural population. The density of population has generally a very definite relation to the mortality.

Dr. Farr attempted to deduce a formula by which the mortality of any locality could be translated into that of another having a different degree of aggregation of the population. He showed that when the population has reached a certain density, there is a constant and uniform increase in the death rate with any further increase in its density. For example, in 50 districts in Great Britain, with a population of 2,500,000 and with 650 persons to a square mile, the death rate was 20.5 per thousand. In those districts which contained 2100 persons to a square mile and a population of 2,000,000 the death rate had increased to 24.4; with a population of 2800 to a square mile the death rate had further increased to 25.5, and with a population of 6144 persons to a square mile the death rate was 30.2.

The local variation in mortality with the density of population has not been constant in New York city, for in some of the wards, where the density of the population is greatest, the mortality has been below the average, and in other wards, with a relatively scarce population, the mortality has been extremely high. Other factors have exerted an even greater influence on local variations of mortality than density. The highest death rates have been found in the lower and oldest parts of the city, where the buildings are old and the sanitary conditions in many respects unfavorable.

The nationality of the population has a definite influence, as has been shown in an analysis of the death rates in different parts of New York city made by Dr. Roger S. Tracy, Registrar of Vital Statistics. Those districts with the densest population, where the rates are comparatively low, are largely inhabited by Russian and Polish Jews, who are a hardy race and

proverbially long lived. On the other hand, the wards having the highest death rates, or nearly the highest, are occupied largely by Italians, among whom, in the United States at least, the death rate is exceedingly high.

The sanitary problems presented in a city like New York are unusually difficult, on account of the diversity and cosmopolitan character of the population. The presence of large numbers of foreign-born inhabitants of many different nationalities, grouped often in restricted localities and retaining their native customs and modes of life, and the great density of the population, constitute factors which largely complicate the situation.

The physical conformation of Manhattan Island is, in some respects, exceedingly unfavorable. The island is long and very narrow, and as a result certain parts of the city, and in fact the island as a whole, is overcrowded. Fully three-fourths of the population live in tenement houses, which are five, six, or more stories in height, and contain from two to four or more families on each floor. Each house is placed on a lot not more than 25x100 feet, and frequently 20 families, numbering more than 100 persons, live on an area of this size.

The average density of population in New York city below the Harlem River, *i. e.*, on Manhattan Island, is greater than that of any of the other great cities of the world. The only localities approaching in density of population certain wards in New York are a small area in Paris, where the population is 430 to the acre; one district in Prague, where the population is 495 to the acre; the Whitechapel district in London, which has a population of about 300 to the acre in Spitalfields, Mile End, and Newton, and 365 in Bethnel Green. In New York city, Sanitary District A of Ward XI. has a population of more than 800 to the acre; Ward X., over 640 to the acre; Ward XIII., 540; Ward VII., 360; and Ward XIV., 295.

These facts must be kept in mind in considering the mortality statistics of New York, as compared with those of the large cities of Great Britain and the Continent. With these before us, the diminution in the death rates, and the present death rate, are most significant.

A comparison of the mean total death rate for decennial periods in New York city since 1834 shows that there was an increase during the first three periods ending in 1863, and that since that date there has been a continuous and very heavy decline in the rate, especially marked in the most recent years. The mortality in New York arose to such a high point that the inhabitants became alarmed, and in 1866 the Health Department as now constituted was organized. In the decennial period ending in 1843 the mean death-rate was 28.03; for the period ending 1853 it had risen to 33.81; during the next period, ending in 1863, it was 33.94. Since that time it has declined to 31.11 for the decennial period ending in 1873; to 26.87 for the period ending in 1883; to 25.78 for the period ending in 1893, while in the year 1894 it was 22.76; in 1895, 23.10; in 1896, 21.54, and for the first half of 1897, 19.60. The population meanwhile has increased from 312,000 in 1840 to an estimated population of 1,990,000 on July 1, 1897.

The mortality rate is normally higher for the first half of the year than the second half, and it is therefore probable that the rate for 1897 will be a fraction over 19, or a diminution of 25 per cent. on the death rate for the decennial period ending in 1893.

The percentage of mortality occurring in children under five is always high, and has been long regarded as an excellent index of existing sanitary conditions. The injurious effects of unsanitary conditions and surroundings always fall heaviest upon the youngest element of the population.

Table VI. shows the death rate from all causes and the rate over and under five years of age for the decennial periods since 1866, and for 1894–95–96 and the first half of 1897.

As will be seen, the average death rate in children under five for 1894, '95, and '96, was 40 or more per 1000 less than the average rate during the eight-year period ending in 1873, and in 1896 was 47, or 38 per cent. less than for this period. In 1897 there will undoubtedly be a still greater diminution, although the death rate for children under five for the first six months of the year cannot be taken as the average for the year, as the deaths from diarrheal diseases are always much lower during the first half of the year.

TABLE V.

Annual death rate in New York City from all causes, and for certain diseases, 1886–1896, inclusive, and January–July, 1897:

Year.	All Causes.	Diphtheria and Croup.	Phthisis.	All Tubercular Diseases.	Measles.	Small-pox.	Scarlet Fever.	Typhoid Fever.	Diarrheal Diseases of Children under Five Years.	Diphtheria and Croup, all Tubercular diseases, Measles, Small-pox, Scarlet Fever, Typhoid Fever, and Diarrheal Diseases of Children under Five Years.
1886	25.99	1.87	3.79	4.42	0.46	0.022	0.26	0.23	2.08	9.34
1887	25.32	2.06	3.56	4.06	0.52	0.067	0.40	0.22	2.20	9.53
1888	26.39	1.68	3.46	3.90	0.39	0.050	0.89	0.24	2.00	9.24
1889	25.32	1.46	3.31	3.86	0.30	0.0006	0.79	0.25	2.00	8.86
1890	24.87	1.11	3.41	3.97	0.45	0.001	0.92	0.22	1.86	7.86
1891	26.31	1.19	3.11	3.56	0.40	0.001	0.74	0.23	1.92	8.04
1892	25.95	1.23	2.95	3.55	0.51	0.050	0.57	0.23	1.85	7.99
1893	25.30	1.45	2.91	3.51	0.22	0.060	0.31	0.22	1.65	7.42
1894	22.76	1.59	2.57	3.16	0.32	0.085	0.30	0.18	1.50	7.14
1895	23.11	1.05	2.77	3.34	0.42	0.005	0.25	0.17	1.51	6.75
1896	21.52	0.91	2.58	3.06	0.37	0.0005	0.21	0.15	1.32	6.02
Ja.–Jy., 1897	19.60	. . .	2.44	2.97	0.20	0.021	0.30	. . .	. . .	. . .

TABLE VI.

Death rates in New York city for all causes and for certain diseases by decennial periods, 1844 to 1893; by years, 1894, 1895, and 1896, and January–July, 1897.

	All Causes.	Over Five Years of Age.	Under Five Years of Age.[1]	Miasmatic, Diarrheal and Tubercular Diseases.[2]
1844 to 1853[3]	33.81	. . .	. . .	. . .
1854 to 1863	33.94	. . .	. . .	. . .
1866 to 1873[4]	31.11	17.2	123.3	13.2
1874 to 1883	26.87	16.4	104.7	11.8
1884 to 1893	25.78	16.8	95.1	9.3
1894	22.76	14.7	85.3	7.5
1895	23.11	15.1	85.3	7.2
1896	21.52	14.5	76.4	6.4
January to July, 1897	19.60	13.9	64.8	[5]5.4

This table also shows the combined death rate from miasmatic, diarrheal, and tubercular diseases for these same periods and years, and, as will be noted, there has been a diminution of more than 50 per cent. in the deaths from these diseases during these years.

The search for the causes of diminished mortality from all causes shows that the largest reduction has been in the zymotic death rate, including diarrheal diseases of children under five, and there has been also a steady and important decline in the tubercular death rate since 1886. (Table V.)

Investigation further shows that a special reduction in the mortality from diphtheria and croup, amounting to nearly 40 per cent., has occurred since the introduction of diphtheria antitoxin with the beginning of 1895. This reduction has taken place in spite of an increase in the number of reported cases of this disease. Up to the beginning of 1895 there had been a steady increase for some years in the mortality from diphtheria and croup, and for the year 1894 the death rate was higher than that from any

[1] The population under five years of age is computed for each decennial period or year as 11.37 per cent. of the total population, based on the census of April, 1895. In 1880 the percentage of population under five years to total population was 11.63, based on the United States census of that year.

[2] Miasmatic diseases include small-pox, measles, scarlet fever, typhoid fever, typhus fever, simple and ill-defined and irritative fevers, diphtheria, croup, and whooping-cough.

[3] The general death rate prior to 1851 is below the actual rate, as the registration of deaths, where burials occurred within the city limits, was not required by law.

[4] Eight years only: 1866–1873. Health Department organized in 1866.

[5] This rate is comparatively too low, as the deaths from diarrheal diseases are at a maximum during the third quarter of the year.

The rates given in the above tables are the crude death rates.

other single disease, excepting tuberculosis and pneumonia—pneumonia really including a number of different affections. The combined death rate from measles, scarlet fever, diphtheria, croup, small-pox, and typhoid fever has been reduced almost exactly one-half within ten years, the rate for 1896 for these diseases being 1.64 per 1000 population, as contrasted with 3.36 for 1887 ; for 1897 it will apparently be still lower.

The government of the United States is democratic, but the sanitary measures adopted are sometimes autocratic, and the functions performed by sanitary authorities paternal in character. We are prepared, when necessary, to introduce and enforce, and the people are ready to accept, measures which might seem radical and arbitrary, if they were not plainly designed for the public good, and evidently beneficent in their effects. Even among the most ignorant of our foreign-born population few or no indications of opposition or resentment are exhibited to the exercise of arbitrary power in sanitary matters. The public press will approve, the people are prepared to support, and the courts sustain, any intelligent procedures which are evidently directed to the preservation of the public health. The belief is never aroused in any class of the population, however ignorant, that the institution or enforcement of any sanitary measure is primarily designed for the restriction of individual freedom. There is nowhere to be found any jealousy or distrust of law or government, as such. It is, therefore, possible to adopt measures more arbitrary in many respects than could be adopted in most other countries, simply because our government is democratic.

This gives the key note to the attitude of the sanitary authorities of New York. The most autocratic powers, capable of the broadest construction, are given to them under the law. Everything which is detrimental to health or dangerous to life, under the freest interpretation, is regarded as coming within the province of the Health Department. So broad is the construction of the law, that everything which improperly or unnecessarily interferes with the comfort or enjoyment of life, as well as those things which are strictly speaking detrimental to health or dangerous to life, may become the subject to action on the part of the Board of Health. It attempts not only to increase the healthfulness of the city, but also to render it a more enjoyable and comfortable place of residence. In its relation to the medical profession, it aims to give every assistance which the latest scientific investigations can place within its power, in the treatment and management of communicable and infectious diseases, while not interfering in any way with the privileges or prerogatives of the medical attendant, unless such interference becomes necessary for the protection of other persons from possible infectious diseases, the violation of which may be followed by the forcible removal of the patient to its hospitals. The public press, quite without reference to its political affiliations, offers a unanimous and most cordial support to the policy of the Board.

The conduct of sanitary matters in New York is restrained by no tra-

ditions or precedent. It is determined from month to month by what is believed to be for the best good of the inhabitants, in view of the most recent knowledge and the latest developments in scientific medicine.

The limits of this address do not permit, nor is it desirable, that I should touch upon many of the other phases of the work of the Health Department indirectly related to the prevention of disease and the preservation of the public health.

It has been my purpose, as was stated in the introduction, simply to detail some of the features which have more particularly distinguished the work of the New York City Health Department, and to describe some of the phases of the sanitary supervision of certain infectious diseases which has been introduced by it.

I believe it may be truly said that there is no great city in the world to-day which, in the broad sense, is cleaner and healthier than New York. By clean is meant the purity of the atmosphere, the cleanliness of the streets, the abundance and purity of the water supply, and the efficiency of the sewerage system. I wish that so much could be said as to the character of the habitations of the poor, the public baths and public convenience stations, the breadth of its park and public commons, and the type of its charitable and penal institutions. In many of these respects New York is deficient; but great and rapid advances have been made and are being made in these matters.

When it is said that no city is healthier than New York, this statement is made with a consideration of all the sanitary factors in the situation, such as the size and density of the population, the varied nationality of the inhabitants, the character of the climate, etc.

Nowhere can there be found a fuller recognition than in the United States, of England's high standard of excellence in public medicine, or a more sincere appreciation of her vast contributions to the progress of sanitary science. But she must look well to her laurels, if her cities are to be kept cleaner than the great cities of the United States, and her urban population made healthier and happier than the same class on this side the Atlantic.

In the United States we are prepared to adopt, without hesitation, the best that England produces, or that the world affords, in public medicine, as well as in science, art, and commerce; and notwithstanding the persistent and determined efforts of our sensational press, the sentiments of the medical profession and of the people at large towards Great Britain are those of sincere respect for her institutions, profound admiration for her great achievements, and warm affection for her people.

If I have appeared in this address to dwell too long upon and described too fully some of the sanitary methods followed in New York, I would urge in extenuation that it has been from a desire that you should know our institutions and methods, as well as we know yours, and that through the medium of this great medical association, the largest and most influential in

the world, the two great English-speaking nations might, in this respect, be brought into somewhat closer and more intelligent relations with each other, and thus greater good redound to preventive medicine, so that the people of both nations may live healthier and, therefore, longer and happier lives.

ON THE INFLUENCES THAT HAVE DETERMINED THE PROGRESS OF MEDICINE DURING THE PRECEDING TWO AND A HALF CENTURIES.[1]

BY STEPHEN MACKENZIE, M.D., F.R.C.P.,

Senior Physician to and Lecturer on Medicine in the London Hospital.

On this very interesting and, indeed, unique occasion, when the British Medical Association meets for the first time on Canadian soil, the mind is irresistibly led to compare the condition of medicine at the present day with that which existed when Europeans first settled in Canada, and to trace the paths by which progress has been made. When Maisonneuve and his companions landed in what is now the Custom-House Square in Montreal in 1642, and when, shortly after, the first hospital was established by the missionary priests, medicine was in a rudimentary stage. Though anatomy had been prosecuted for some centuries, chiefly on the European continent, it formed no part of ordinary medical education, physiology in the scientific sense was unborn, and organic chemistry not yet created. The medical teaching of that day consisted mainly of the ancient doctrines of the four elements and their corresponding temperaments; of the separate functions of the vegetative, sentient, and rational souls; of the agency of the natural, vital, and animal spirits, that had continued to be taught with very little variation from the time of Galen. It was an age of aphorisms, definitions, systems, and nosologies. Medical opinions were so dominated by theories and burdened by the weight of authority that the phenomena of disease for the most part passed unnoticed and its teachings were neglected. Such knowledge of medicine as the enterprising members of the medical profession who accompanied the early expedition to Canada possessed must have been of the most elementary character, gained by apprenticeship under teachers whose knowledge consisted in the doctrines of Hippocrates and Galen, and such crude experience as they themselves had obtained. Without doubt they were as zealous and earnest in their professional duties as we as a profession are to-day, and their treatment was as certainly unfettered and unrestrained by any scepticism as to the theories

[1] Presidential Address before the Section of Medicine of the British Medical Association at Montreal, September 1, 1897.

they had been taught, or doubt as to the efficiency of their remedies for disease. But this period was the dawn of a new era in science and medicine. Harvey's great work "On the Movements of the Heart and Blood" and Bacon's "Novum Organon" had recently been given to the world, and the seventeenth century was a time of the greatest activity and discovery in geography and in science.

What a gulf separates that medicine of 250 years ago from that of to-day! In tracing how it has been bridged, it is right that we should justly apportion the influence that various spheres of activity have exercised in reaching our present position.

The Study of Anatomy.—We must in the first place ascribe the greatest importance to the study of anatomy. Vesalius and Sylvius, Fallopius and Fabricius had already advanced it to a very high point, but the study had been confined to the leisured few. Gradually our knowledge of every detail of naked-eye anatomy has been gained, and at the present time every one practising medicine must have a competent knowledge on the subject gained by dissection. The same systematic study has extended to comparative anatomy, and great, for its time, as was the knowledge of Aristotle, it has undergone an entire revolution by the application of scientific methods to increased data of information by such workers as Cuvier, Darwin, and Owen. It is now taught as a branch of medical education. Physiology could have no scientific basis until anatomy was fairly advanced. The facts on which it was at first based were founded on medical observations, but in the seventeenth century direct observations and investigations were commenced by Haller, Hunter, Spallanzani, and Hewson. It has since been prosecuted with the greatest energy and success, and the position of physiology at the present time is that of a science, explaining the action and interaction of the organs and tissues and the forces of the body, which are the true foundation of scientific medical knowledge—the institutes of medicine. Morbid anatomy could not exist until normal anatomy was fairly complete, but from that time in the eighteenth century, by the laborious researches of Morgagni and numerous other workers, until now, the broad facts of morbid anatomy have been accumulating until we have at the present day a fairly accurate knowledge of the principal pathological changes found in the body. The rise of physics and chemistry in the seventeenth and eighteenth centuries contributed greatly to the progress of medicine, by increasing our powers of "searching out the secrets of nature" by methods and instruments of precision.

The Study of Histology.—Of any one influence that has helped the advance of scientific study and the progress of medicine probably the increasing perfection of the microscope has been the greatest. With each new development of this instrument a greater range has been given to our researches, and, with the assistance of chemistry, it is continuing to reveal to us fresh facts that have created new branches of science. Starting from the observations of Bichât on the minute anatomy of the tissues in 1801,

the microscope has enabled us to understand the details of structure which were essential to complete anatomy. Until the microscope was capable of practical use the capillaries could not have been discovered by Malpighi, nor the composition of the blood understood; the mechanism of renal secretion could not be worked out until the minute structure of the kidney was known; the functions of glands and the processes of digestion and secretion could not be understood until the histological details of the parts concerned were ascertained; the mechanisms of sight and hearing, of taste and smell were not revealed until the ultimate details of the structures involved had been investigated; the marvellous complexity of the nervous system, as in the delicate though comparatively coarse structure of the nerves, the higher intricacy of the spinal cord, and the marvellous details of the arrangement of ganglionic cells and communicating fibres of the cerebral tissue, which by improved methods of preparation and staining are being revealed to us at the present time, could not have been worked out without its aid. Just as anatomy had to reach a certain stage before physiology and morbid anatomy became possible, so normal histology had to advance before pathological histology could come into existence. And, as knowledge advances from the special to the general, special pathological histology had to reach to a very high point before we could reach that knowledge of general pathology on which our conceptions of the nature of disease are at present based.

What would Harvey have given to see the capillaries that completed the "circle" of the blood-stream, or to have watched the process of inflammation in the exposed mesentery of the frog by the aid of the microscope—to see the contraction followed by dilatation of the blood-vessels, the escape of the blood-corpuscles through the walls of the vessels? What a vastly different conception has the reader of Cohnheim's "Lectures on General Pathology" from that of the most advanced and profound investigator and physician of two and a half centuries ago! The microscope again has introduced us to a new world, revealing minute organisms that play a great part in the plan of nature and which are largely concerned in the production of disease. It has led to a new department of science, bacteriology, which has taught us how bacteria enter the body, how they increase and multiply therein, and of the reaction of the tissues for self-protection. Chemistry has shown how the poisons formed by such organisms act in the body and supplied us with means, as yet only in their infancy, for counteracting their effects, or guarding against their entrance by their exclusion and by protective inoculation. The microscope has further furnished us with evidence of parasitism, other than bacteria, in the blood, in the muscles, in the skin and hair, and on the mucous membranes. By its aid we are able to diagnose and watch the course of several primary diseases of the blood. It has enabled us to differentiate the various new growths that develop in our bodies. So much does the microscope constitute a necessary means of research that it would be impossible conscientiously to perform our daily medical duties without its aid.

Clinical Instruments of Precision.—The thermometer, again, has been of invaluable aid in the study of diseases, allowing of our measuring and recording the degree of fever, and of watching its progress with such a degree of accuracy as to furnish us with evidence of the greatest value in the diagnosis, prognosis, and treatment of disease. Electricity, by the laborious and complete investigations of Du Bois-Reymond, has revealed to us the mode of action of nerve and muscle that would have been impossible to obtain in any other way. Though the hopes at first entertained of its value in the treatment of diseases have not been altogether fulfilled, it is still of much service in this respect, and perhaps still more valuable as an aid in diagnosis.

The ophthalmoscope, introduced by Helmholtz, has enabled us to understand diseases of the interior of the eye, which without its assistance was impossible. It has admitted of the exact examination of refraction, and has revealed changes in the termination of the optic nerve, in the retina and choroid, not only valuable in themselves, but so important in the light they throw on pathological changes occurring in the nervous system, and in the body generally, that the use of this instrument has become a necessity of practical medicine.

The laryngoscope, perfected by Czermak, has given precision to the diagnosis and treatment of diseases of the throat not otherwise attainable, and which has important bearings on general medicine, by the recognition of paralysis of the muscles that move the vocal cords in aneurism and in disease of the central nervous system.

The sphygmograph, the cardiograph, the arteriometer, and, the latest invention of this class, the sphygmometer have enabled us to ascertain the exact condition of the circulatory system, of the greatest service not only in studying the problems of normal and abnormal physiology, but in the rocognition of disease and its tendencies, and in the influence of remedies.

Auscultation.—Nothing from the time of Harvey gave such an impetus to the study of exact medicine as the introduction or discovery of auscultation by Laennec in 1816 ; and, indeed, Harvey's great discovery had little practical application in clinical medicine until its introduction. Auenbrugger had introduced percussion in 1761. Laennec had adopted it, and his discovery of auscultation, with his zeal as a morbid anatomist, enabled him to work out most of the great problems of diseases of the thorax. The knowledge thus begun has, by the labors of many workers, increased in range and accuracy down to the present time, and the diagnosis of diseases of the chest has reached a degree of precision unequalled in any other department of practical medicine. We are now able not only to recognize disease of each of the valves of the heart, but to estimate its degree and the influence of the lesion on the greater and lesser circulations, and to trace the course and effects of emboli carried along the blood-stream. Our knowledge of diseases of the lungs is nearly as complete as that of the circulatory system.

Vaccination.—During the period that bridges the time from when Canada first became populated by Europeans to the present day, probably no discovery has exercised a greater influence in medical science or conferred more lasting benefits on mankind than the introduction of vaccination by Jenner. It is not necessary in such a meeting to trace how Jenner was led to his discovery. Protective inoculation from small-pox by the introduction of the small-pox matter had long been known in the East, and had been introduced into England by Lady Mary Wortley Montagu; but Jenner's rare merit consisted in testing the statement made to him by Gloucestershire rustics, by scientific methods and experiments, and by waiting for years until the value of the protection of the "variolæ vaccine," introduced by inoculation into the human subject, had been tested by exposure to contagion from small-pox and until time had elapsed to demonstrate that this protection was no ephemeral influence, but of more or less permanent duration, as much as that of an attack of small-pox itself. "I never expected it would do more, and it will not, I believe, do less," are Jenner's words. It was not until many years after he had satisfied himself as to the protective influence of the vaccine virus that Jenner in 1796 published his observations. It is needless to trace the effects this discovery has had in saving human lives, and in averting the disfigurements with which those who escaped death from the disease were almost invariably afflicted. It is probable that the full significance of his discovery was not revealed to Jenner himself, and, on the other hand, it is possible that he exercised self-restraint in not speculating as to the possible results that might accrue from his remarkable inquiries. Certain it is that the indirect results that have followed from Jenner's discovery, that an attenuated virus was protective against contagion from the disease from which the virus was originally obtained, have only recently been fully utilized. Probably several causes have been concerned in the want of continuity of progress in this direction, the most important of which has been the difficulty in isolating and handling the virus in many contagious diseases. The investigations into the full extent of the value of inoculation with attenuated virus and derivatives of bacteria have only been commenced in the last few decades, since bacteriology has been cultivated by Pasteur, Lister, Koch, Klein, Gaffkey, Martin, and others, and the whole subject with the aid of organic chemistry made a branch of exact science. Bacteria are now classified by their morphological qualities, by their reactions to staining reagents, by their modes of growth in various media, the temperature at which they grow and at which they are destroyed is determined, their need of oxygen ascertained, the parts of the body they make their habitat studied, the effects of their invasion in the tissues and the protective powers of the organism observed. The chemical products to which they give rise are isolated, their nature ascertained, and their effects observed on the living body independently of that of the organisms by which they are formed. Finally the knowledge thus obtained is turned against

the bacteria. The virus is attenuated by various methods, often by passing through the body of an animal immune to the disease, and its exact strength is ascertained. It is then used for protective inoculations or for antidotal purposes in those already attacked by the disease from which the virus was originally obtained. Jenner's and the recent researches are equally scientific, observation, induction, experiment, but the differences in carrying out the inquiry on small-pox by Jenner and that of any specific disease due to an organized virus at the present time illustrate my theme of how the progress of medical science has been effected. Great as it has been, and precise, as a rule, as are our methods of research, it is remarkable that up to the present time in two diseases in which protective and curative inoculations have been most conspicuously successful, namely small-pox, in which we had, thanks to Jenner, the first vaccine, and in hydrophobia, in which Pasteur succeeded in attenuating the virus and using it as antidote, we have not succeeded in finding the micro-organism that is the true virus, unless, indeed, Copeman Monkton has at length done so in the case of small-pox and vaccinia. As a matter of fact, this organized virus has yet to be discovered in many of the most common specific communicable diseases, but the knowledge gained by the study of some members of this class in animals and of some—*e. g.*, diphtheria—in the human subject has afforded a basis of knowledge applicable to the whole group.

There is one other branch of medical science which has been incidentally alluded to in the previous remarks, but which requires fuller recognition in the survey of the influences that have governed our progress. I allude to experimental investigations in animals. In the seventeenth century, in the hands of Harvey and others, but more especially in the eighteenth, by the labors of Hunter and others, and in the nineteenth century, this method of observation has been the basis of normal physiology, and later of abnormal physiology or pathology and therapeutics. These investigations enabled us to reach a degree of knowledge not obtainable in other ways, not only of value to man, but also to the lower creation.

Therapeutics.—Until the exact nature of disease is fully understood, a truly scientific treatment is manifestly impossible. I need not discuss how entirely in the past, but also at the present day, our knowledge of treatment has been mainly empirical. It could not be otherwise. It is true that up to the present time scientific therapeutics has only influenced our treatment to a small extent. But looking back, as we have been doing, to the course of progress in medicine, we have seen that it has throughout followed the line of patient and exact research. The action of drugs is now studied with the same care and precision that have been employed in physiology and pathology, and we are yearly adding to the stock of exact knowledge of the action of remedies. The scientific application of this knowledge will come with a more complete understanding of the cause of disease, increased knowledge of pathology, and greater precision in diagnosis. But therapeutics is not conterminous with drug treatment. It in-

cludes all the circumstances of the management of the sick, the surroundings, the feeding, and general care of the patient. In all of these respects enormous strides have been made, which greatly influence the chances of recovery of the patient of to-day. Moreover, therapeutics includes prophylaxis, the prevention of disease. It is in preventive medicine that the greatest triumphs of medicine have been and will continue to be gained. The work of Jenner, Pasteur, Lister, Koch, and other pioneers of preventive medicine, has saved more lives, probably, than remedial art can claim. Fresh fields of the therapeutical triumphs are opening to us in the employment of antitoxin serums and extracts of animal secretions, so that, if therapeutics has lagged behind other branches of medical science, it has been due to unavoidable causes, and we may look forward hopefully and confidently to its future.

The Growth of the University System.—We must not leave out of consideration, in tracing the path of progress, the remarkable development of the university system in all civilized countries, and the increased care and methods of medical teaching.

All the branches of scientific knowledge we have been considering, anatomy and physiology, chemistry and physics, morbid anatomy and pathology, therapeutics and preventive medicine, have helped us to the knowledge we at present possess. But they have rendered a further aid to medicine than the mere knowledge they enabled us to acquire. Themselves scientific studies utilizing methods and instruments of precision, they have influenced our whole mode of thought and made us exact and precise in our observations and investigations of disease. We may paraphrase an expression of Burdon-Sanderson's: "The history of modern medicine is largely the history of scientific method." So, when we are taunted with the assertion that medicine is not a science, we can reply that medicine utilizes the knowledge gained in every branch of science, and is scientific in its methods of research into the nature and treatment of disease. If its results are not so exact as in some other branches of knowledge, it is not due to any want of scientific method and care in its investigations, but to the very complicated phenomena with which it has to deal, whilst the investigator has not the same unfettered freedom of dealing with his subject that the investigator into chemistry or physics has. By a continuance of the same methods and exact research we cannot for a moment doubt that the progress that has been so manifest in the past will be exceeded in the future.

Clinical Medicine.—If we turn now to clinical medicine we shall see what great strides in progress have been made. It is possible to give only a few illustrations in the time at my disposal.

Fevers.—One of the most important advances in clinical medicine has been the separation of enteric from typhus fever by the labors of Jenner, A. P. Stewart, Murchison, Liebermeister, and, in America, by Smart. Relapsing fever has in like manner been separated from the other fevers

by Barker and Cheyne, by Graves and Stokes, whilst, in 1873, Obermeier described the spirillum in the blood of this disease, at that time the only instance in which a specific organism in the blood was proved to be always present in fevers. Quite recently by the labors of Laveran and Marchiafava, Celli and Golgi, Councilman and Osler, after previous unsuccessful attempts by Salisbury and Balustra, Klebs and Tommasi-Crudeli, it has been conclusively proved that a microscopic parasite, the *Plasmodium malariæ*, is the actual cause of malarial diseases that are so common and destructive in some parts of this continent and in other parts of the world. All these gains to clinical medicine, so important in the recognition and treatment of disease, have been due to increased precision in clinical observation and morbid anatomy, aided in a high degree by the use of the microscope.

Diseases of the Kidneys.—It may be safely asserted that two and a half centuries ago nothing was known of diseases of the kidney except the facts of the very coarsest lesions, such as calculus and suppuration. Even these were very imperfectly connected with their clinical manifestations. The detection of albumin in the urine by Cotugne in 1770, followed by the observations of Wells and Blackall, but more especially the work of Richard Bright, who combined in a rare degree the powers of accurate clinical observation and diligent post-mortem research, furnished a new vantage ground to the study of clinical medicine. The continued researches of many of the ablest physicians in all countries, who have availed themselves of each new discovery and perfection of instruments of exact investigation have brought our knowledge to a very high degree of perfection on this sub, ject. The recognition of the association of increased arterial tension with renal disease, and the far-reaching effects of this in the production of cerebral hemorrhages and other consequences, has been one of the triumphs of modern medicine.

Diseases of the Nervous System.—The gradual unfolding of the closed book of the nervous system, by the successive gains in our knowledge of its anatomy and physiology, the invaluable work of Sir Charles Bell and Marshall Hall, the histological researches of Caskell, the clinical and pathological work of Charcot and Westphal, the experimental work of Fritz and Hitzig, of Ferrier, Bevor, Victor Horsley, and others, has helped us to understand in a great measure the working of the nervous system and the effects of its lesions. But clinical medicine may justly claim to have had a large share in aiding us to reach our present knowledge of its workings and diseases. The deductions of Hughlings-Jackson and Broadbent, and the recent valuable work by Starr, Edward Head, and Thurston have greatly increased our knowledge of the physiology of the nervous system and aided us in our means of diagnosis. Improved methods of surgical technique, especially the advent of antiseptic surgery by the genius of Lister, have brought some of these into the region of curative treatment.

Addison's Disease.—The discovery by Addison of the association of

asthenia, gastric irritation, and pigmentation of the skin with diseased changes in the suprarenal bodies will always remain a model of good scientific work, combining clinical and pathological observation. At the time when Addison recorded his observations no definite functions were ascribed to the adrenals, and he could do no more than draw attention to the association of the clinical and post-mortem conditions. The full fruition of his discovery was to come later when it was established that the suprarenal bodies formed a secretion which supplied to the circulation, probably through the vasomotor centres, a stimulus or tonic necessary for the maintenance of health, and the asthenia which is the cause of death in Addison's disease is due to the deprivation of this secretion by destruction of the adrenals.

Myxedema.—In the development of our knowledge of this condition we have one of the most completely worked out sections of medical knowledge, and the manner and modes in which our knowledge has been gained are most instructive. Starting from the recognition of endemic cretinism in regions in which goitre is prevalent, we next have the observations of sporadic cretinism in England by Curling, who noted that the thyroid gland was ill developed or absent in these cases. Then came the description by Gull of "a Cretinoid State supervening in Adult Life in Women." Later followed a communication by Ord, in which he pointed out that the changes in this disease were due to a mucin yielding edema, and who also noted the atrophy of the thyroid body, and discussed its relations to endemic and sporadic cretinism. He gave to the disease the name of myxedema, which it has since been known by. Next the observation of Reverden and Kocher that a condition similar to myxedema was apt to follow upon total extirpation of the thyroid gland for the cure of goitre. The latter called this condition "cachexia strumapriva." Semon pointed out the identity of myxedema, cachexia strumapriva, and cretinism, and that each was dependent on a loss of function of the thyroid body. Paul Bruns published a case in which the extirpation of the thyroid gland in a boy, aged ten, had been followed by the condition hitherto described in this country as sporadic cretinism. Then Victor Horsley by experimental research on animals succeeded in demonstrating that loss of function of the thyroid gland produced all the symptoms known as myxedema and strumapriva, and varying the mode of experimentation obtained strong evidence that cretinism was a more chronic form of the condition. Finally came the crowning of the edifice by Horsley proving that transplantation of the thyroid gland arrested the changes, by the same results being obtained by Murray by subcutaneous injections, by Hector Mackenzie by feeding with the glands, and lastly by other observers by the internal administration of an extract of the thyroid body. By these means we have learnt that myxedema and sporadic cretinism can not only be kept at bay, but that in the latter class of cases a remarkable growth and development can be brought about. Thus it has been shown that the thyroid gland and probably

every other ductless gland removes or forms certain products from the body, and that the integrity of those glands is essential to the well-being of the individual. This knowledge is being turned to account in the treatment of quite a number of conditions. It is interesting to observe how these results have been acquired by the steady progress of scientific methods of observation and research, and to my mind the Report of the Myxedema Committee of the Clinical Society of London, which embraces most of the above facts, is one of the most instructive contributions to medicine, by showing how each of the great branches of medical science has contributed to the result.

Conclusion.—The question may be asked, have the great and undoubted advances in medicine been attended with any benefit to mankind? To this question no uncertain answer will be given. Human life has been prolonged, and not only is this so, but, as brought out very clearly by Dr. James Pollock, from the figures of Mr. Noel Humphreys, several years have been added to the most useful and valuable period of life. There has been a manifest decrease of mortality from small-pox, scarlet fever, diarrhea, typhus, enteric fever, phthisis, convulsions, croup, diseases of the digestive system, and puerperal diseases, etc. On the other hand, there has been an increase of mortality from cancer and some other diseases. The gains have been greater than the losses, and this is not the occasion to discuss why we have failed in this direction.

But whilst the review we have taken of the progress of the science and art of medicine is encouraging, we must remember there will always be a limit to our powers of curing disease. When any part of the higher tissues is destroyed it can never be replaced by the recuperative powers of nature or improvements in medical science. Sclerosis and destruction of the nervous elements means that they are almost irremediably lost. If the lung is destroyed by tubercle or other disease it can never be replaced. Nothing can make good disintegration of the kidney or liver. Nor shall we ever be able to retard the effects of time. "To die is as natural as to be born," it has been truly said, and the silver cord that chains us to this world must sooner or later give way. Great as have been the improvements in the treatment of disease, our greatest triumphs, in the future as in the past, will continue in the prevention of disease.

One of the most important features in modern medicine has been the remarkable development of medical societies and associations, and the fact that they are yearly increasing is strong evidence that the profession finds them useful in its work. They enable us to submit our observations and inquiries, our theories and our practice, to the criticism of those most competent to discuss them, and thus to separate the wheat from the chaff. The meetings of the British Medical Association amongst others have been most useful in this respect. Let me conclude by expressing a hope that the work done at this meeting at Montreal, and especially this Section of Medicine, will aid in the search after truth, will stimulate and ennoble the aims and energies of those taking part in its proceedings, for the advancement of knowledge and the good of mankind.

ON THE TEACHING OF SURGERY.[1]

BY CHRISTOPHER HEATH, F.R.C.S.,

Holme Professor of Clinical Surgery in University College, London, and Senior Surgeon of University College Hospital.

Gentlemen,—In taking the chair at this the opening meeting of the Section of Surgery, allow me to express my sense of the high honor I enjoy in presiding here to-day. It is no small matter for an English surgeon to be called upon to preside over colleagues of such eminence as are represented by the vice-presidents of the Surgical Section, and I beg leave to tender to them, and to the eminent surgeon who is president of the Association, my thanks for having selected me for so distinguished a position. As an English surgeon it gives me the greatest pleasure to meet the members of the profession in the Canadian portion of Greater Britain, and also those medical brethren from the United States who have been good enough to attend this meeting. I trust your deliberations will not merely advance the science of surgery, but will cement those bonds of fellowship between the members of a united profession which our common Anglo-Saxon origin should foster and maintain.

In addition to the various papers which will be read in the Surgical Section, it has been thought desirable that there shall be held two discussions on questions of surgical interest; and after considerable deliberation it has been decided that these subjects shall be: (1) Appendicitis and its Surgical Treatment; and (2) the Treatment of Cancer of the Rectum, with special reference to the High Operation. The honorary secretaries have arranged with certain eminent surgeons to introduce these subjects, one this morning and the other to-morrow, and I trust that the discussions will be well supported.

Nothing, I venture to think, is more remarkable than the recent progress of abdominal surgery. Twelve years ago I was engaged in editing a "Dictionary of Practical Surgery," and neither appendicitis nor the operation for removal of the rectum, with which Kraske's name is connected, was mentioned in it, although I had the assistance of the leading London hospital surgeons. Kraske's original paper, I may mention, was published in 1885, and is referred to in Ball's work on the rectum, published in 1887, and in most surgical works since that date. The subject of appendicitis, so far as British surgery goes, dates from a paper read before the Royal Medical and Chirurgical Society in February, 1888, by Mr. Frederick Treves, though the title of it was "Relapsing Typhlitis Treated by Operation." In August of the same year Mr. Treves opened a discussion on the "Surgical Treatment of Typhlitis," at the meeting of the British Medical

[1] Presidential Address delivered before the Section of Surgery of the British Medical Association at Montreal, September 1, 1897.

Association at Leeds, and subsequently published his address with additions and alterations, in the form of a monograph, entitled "The Surgical Treatment of Perityphlitis." I do not know to whom we are indebted for the hybrid term "appendicitis," but it did not appear in the index to the *British Medical Journal* before 1891.

But it is not merely in these two departments that progress has been made. The surgery of the kidney and of the liver has advanced *pari passu* with that of the hollow viscera, and the labors of Morris and Robson in England, and of Keen and others on this side of the Atlantic, have done much for the relief of suffering and the prolongation of life.

Looking back over forty years of professional life, nothing surprises me more than the change which has come over the treatment of calculus. In my student days, to see Fergusson cut for stone by the lateral method was to witness an operation as near perfection as was conceivable, and the dexterity and rapidity with which the calculus was extracted were only marred by the frequency with which death from septic causes spoiled the skill of the surgeon. To have one's first lithotomy was an event in the life of the young surgeon, and every now and then a reputation was spoiled by some *contretemps* in the public performance of the operation. Later I was the frequent witness of my colleague Henry Thompson's skill in using the lithotrite to break up the calculus in a series of "sittings." Then came in "litholapaxy," or rapid lithotrity, which we owe to Bigelow, the great American surgeon; and, lastly, that recurrence to the old high or suprapubic operation which was due to the Scandinavian surgeon Petersen. Hence the student of to-day rarely, if ever, sees a perineal lithotomy, and as a consequence his interest in the anatomy of the parts concerned in the operation has greatly diminished. Possibly the surgeons of the last generation laid too much stress upon anatomical details, but it is somewhat remarkable to find how little anatomy seems to serve for practice in the present day.

I am told by those who are teaching anatomy now that it is difficult to get the student to take the trouble to make a neat dissection, because he can find in the various museums, and notably at the College of Surgeons of England, such beautiful preparations in spirit that he prefers to study from them or from pictures rather than labor to get out the details for himself. If this is so I can only regret that the present race of students is so short-sighted, for without a working knowledge of human anatomy I can conceive of no progress in surgery.

But I regret to find that in Great Britain at least the teaching of anatomy is gradually getting more and more into the hands of professors who are anatomists, but not surgeons, and that their tendency is to lay stress upon transcendental details rather than surgical relations. When these gentlemen happen to become examiners this tendency to specialize becomes very marked, and as this applies equally to the teachers of physiology and chemistry, the unfortunate medical student becomes the victim

of science (falsely so called), and sometimes develops into that marvellous being, a London B.Sc.

But seriously, are we not overdoing the scientific teaching of the man who has after all to get his living as a practitioner of medicine, surgery, and midwifery? When the medical curriculum was lengthened by a year it was hoped that the additional time would be devoted to clinical work, but I fear that this is by no means always the case, for it is not uncommon for the student to take three years in passing his primary examinations, with the result that but two remain for the study of medicine and surgery. When I became a student of medicine I took to heart the advice of my teacher of physiology, William Bowman, and never allowed a day to pass without visiting the hospital; and though as a lad of sixteen I failed of course to appreciate the importance of all that I saw, yet I saw it, and I can carry my mind back now to cases seen and lessons learnt in the early fifties which are of service to me at the present time. But the student is practically forbidden to enter the wards now until he has satisfied the examiners in anatomy and physiology, which he may or may not do in two years, and there are but three years left for him to study *totam rem medicam*.

Far be it from me to decry the modern methods of teaching medicine in the wards of our hospitals. I believe that the care taken to induct every student into the mysteries of auscultation and percussion are beyond praise; and if with some teachers treatment is regarded as of secondary importance, at least the student has the opportunity of studying the *vis medicatrix naturæ* untrammelled under one teacher, and of watching the effects of every new drug upon the human system under another. But all this takes time, and so also the elaborate manipulations of the gynecological department, the researches of the pathological professor, and all the other teachings of the third and fourth years. And where, then, does surgery come in? Why, I consider myself fortunate if I can secure the regular attendance of candidates for a surgical diploma for the last three months, when their names are put on my list, and I subject them to rigid surgical cross-examination. But if I venture to refer to an illustrative case of last year, I find that no one present saw it or even heard of it, though at the time the whole surgical staff may have been in consultation upon it. How, I ask, is it possible for the student to see the serious surgical ailments which are not very common, such as aneurism, tumors of bone, tetanus, etc., if his attendance in the surgical wards is limited to a few months?

And yet there has never been a time of greater activity in operative surgery, not only among hospital surgeons, but among general practitioners, who, thanks to anesthetics and antiseptics, undertake operations of magnitude which the hospital surgeon of the last generation would have hardly attempted. How are we to explain the apparent contradiction? In the first place, I am afraid we must allow that a great many mistakes in diag-

nosis are made, or rather, too often no attempt at diagnosis is made, but that an operation is undertaken to "clear up the case." That it generally does no doubt, but not always to the benefit of the patient. Then we must allow that, with unlimited time for the anesthetic, the least skilful surgeon may hope to bring an operation to a conclusion more or less satisfactory to himself, and if he operates under fairly favorable circumstances, for his patient also. Lastly comes the enormously increased opportunity for the publication of a success at one of the numerous mutual admiration societies and in one of the medical journals of the day. Can we wonder, then, that young surgeons whose stock-in-trade of professional knowledge is of the smallest, blossom rapidly into operating surgeons in some special department, and try not unsuccessfully to prove that all is fish which comes to their net?

Still, gentlemen, the great foundations of the art and science of surgery remain undisturbed. Without a knowledge of anatomy, of pathology, and histology progress in surgery is impossible, and it is for those who hold the important positions of teachers in our great medical schools to insist upon a foundation of scientific and practical training being given to our students if they are to become the successful practitioners of the future. The growing tendency of the non-medical teachers of collateral science to regard their particular subject as the most essential for the medical student must be restrained, and the preliminary period of medical study must be cleared of many obstructions if the student is to have the necessary time to devote to the thorough study of those strictly medical subjects which will fit him to be a sound, practical, and at the same time scientific, physician and surgeon.

ON THE PROGRESS AND RESULTS OF PATHOLOGICAL WORK.[1]

BY W. WATSON CHEYNE, M.B., F.R.C.S., F.R.S.,
Professor of Surgery, King's College, London, etc.

Gentlemen,—On such an occasion as this one is naturally tempted to look back on the history of pathology during the last sixty years, but I hope that you will not expect me to follow the fashion in this respect. To trace the history of pathology during the last sixty years would be to follow the science practically from its commencement and to go back to a state of matters which it is almost impossible for us now to realize. Even going back to the time when I was first introduced to the study of pathology,

[1] Presidential Address in Pathology delivered before the British Medical Association at Montreal, September 1, 1897.

some twenty-five years ago, the changes which have taken place are enormous. At that time the lectures on pathology consisted practically entirely of morbid anatomy; long descriptions, for the most part very accurate and not materially different at the present day, were given of the naked-eye appearances of the diseased parts, but as to how or why these changes were brought about hardly any reference was made. Indeed, very little was known, and when an explanation was attempted it was generally of a mechanical or physical character. At the present time, while, of course, the changes which take place in disease must be known, the study of pathology is especially directed to the discovery of the mode in which these changes occur and the reasons why they appear. To-day it is the etiological side of pathology, so to speak, which occupies our attention, and deservedly so, for, so far as practical results in the treatment of disease are concerned, the knowledge of the changes produced is of comparatively minor importance as compared with that of the reason why they are set up and how they take place. The more accurately we can trace the etiological factors in disease and the subsequent course of events, the more likely are we to arrive at a rational method of treatment.

The most striking and important advance has been the growth of the great science of bacteriology, a science which has not only led to most important practical results, but has also thrown a flood of light on the processes which go on in the body as a whole, and has stimulated research in other directions not immediately associated with it. Twenty-five years ago bacteriology as a science was non-existent. So far as I remember bacteria were not even alluded to in our course in pathology, and it was only from Lord Lister that we heard the real facts so far as they were known, or gained any idea of the importance of their study; but even at that time, although his methods of treatment were already yielding brilliant results and saving many lives, and although he had deduced from clinical facts many points in the life-history of bacteria and their relations to the living body, which were only confirmed by experiments subsequently, still the number of actual proved facts was extremely few.

It is difficult for those who have only taken up the subject of bacteriology comparatively recently to realize the absolute blank which it presented even twenty years ago. When I became house-surgeon to Lord Lister in 1876 objections of all kinds were urged against the theory on which Listerism was based, some denying the existence of bacteria at all, others maintaining the theory of spontaneous generation; some asserting that organisms were always present in the healthy tissues, others denying that they had anything to do with disease, or that the success of the antiseptic principle depended in any way on the exclusion of the micro-organisms from wounds. Although at the present time such an investigation would be one of the simplest, yet when I came to carry it out I met with the greatest difficulties. Practically nothing of the kind had been done before, and all the means of investigation had to be devised. Methods of staining bacteria

had not been introduced, we had no oil immersion lenses, and I very soon found that by looking at discharges from wounds containing leucocytes, granular matter, and *débris* with dry or water immersion lenses, and without substage condensers, no satisfactory result could be arrived at. Hence I came to the conclusion that attempts must be made to see whether organisms grow in suitable fluids inoculated from the discharges. Here again everything had to be devised. A suitable pabulum, methods of sterilization, of inoculation, and of incubation had to be worked out. A large amount of time was spent in getting over the preliminary difficulties, and after a satisfactory method had been found, much labor had to be devoted to preliminary questions, such as spontaneous generation, morphological characters of bacteria, their presence or absence in the living body, conditions of growth, and so on.

A great advance which followed soon afterwards was the remarkable research by Lord Lister on the *Bacterium lactis*, in which he devised a method of separating bacteria by fractional cultivation, which resulted in the separation of the bacterium which causes lactic fermentation from other organisms. By this research, apart from the method, a great step was gained in the proof of the specificity of a particular bacterium both as regards morphological characters and chemical action.

Then came Koch's work on infective diseases of wounds, and the publication of his methods of staining and examining bacteria and of cultivating them on solid media, and this work is at the foundation of all modern bacteriological research. From this period the investigations have branched off in two directions. In the first place, almost all the infective diseases have been investigated for parasitic organisms. And, in the second place, researches have been carried on in the direction of tracing out the life history and functional activity of bacteria, and of ascertaining what occurs in the body when organisms or their products are introduced.

From the latter point of view we come to another great landmark in the study of bacteriology, namely, Metchnikoff's work on phagocytosis, a theory which is not only very fascinating in itself, but which has proved a most suggestive working hypothesis, leading to many of the researches which have given bacteriology its present position. What a remarkable series of views have been opened up in this direction; questions of the relation of the cells of the body to the parasite, the differentiation of cells, alterations in serum, chemiotaxis, the development of the protective agencies and of antibacteric substances, antitoxins, immunity, and so forth. And yet we are clearly only on the threshold: the very simplicity of many of the explanations is, to my mind, sufficient to show that they are incomplete, for the workings of the living body are far too intricate to be summed up in a simple formula.

In spite, however, of all that has been done, many problems still remain unsolved. In the case of tuberculosis, why is it that in one part of the body we have a slowly growing lupous disease, and in another part, per-

haps, of the same body, a rapidly developing tuberculosis? None of the explanations usually given, such as differences in the structure or resisting power of the tissues affected or of the individual differences in the virulence or activity of the organism, etc., seem to furnish sufficient explanation. And the same problem is apparently presented with regard to the bacilli of diphtheria, in that we may have in one case a true diphtheria, in another a membranous rhinitis, while in a third, although the bacilli are present in the throat, the individual may be apparently healthy.

Another very remarkable problem is presented by the results which follow free incisions into tuberculous tissue. An incision is made into the abdominal cavity, masses of tuberculous tissue and tubercle are found scattered over the peritoneum, nothing whatever is done, the wound is stitched up, and yet in many cases the patient, who up to that time has been going steadily down hill, begins to pick up, and the disease may come entirely to a standstill. This phenomenon is not limited to peritoneal tuberculosis. When I was a student the tuberculous nature of what are now recognized as tuberculous diseases of bones and joints was then only suspected, and was not generally accepted by the medical profession. At that time Lord Lister, under the impression that these diseases were of a simple inflammatory nature, and having observed the improvement which often followed free incisions into chronically inflamed tissues, began as an ordinary line of practice to make free incisions through the thickened synovial membrane of tuberculous joints with the view of relieving tension, which he looked on as the chief cause of the continuance of the trouble. Nothing else was done, the joint was not even washed out, nothing was taken away, and yet in a considerable number of cases so treated improvement began from the time that the incisions were made: the patients lost their pain, the wounds gradually healed up, and the disease subsided. Even in cases in which the results were not so satisfactory it could as a rule be noted that, although the swelling continued in other parts of the joint, and although the disease began again after a few weeks as vigorously as before, yet for a time at least the thickening disappeared in the neighborhood of the scars, showing that there at any rate temporary benefit had occurred. What possible explanation can we give of such a result? The older surgeons used to speak of "setting up a healthy action in the part," and were quite satisfied with that statement. Such a view is too vague for us nowadays, but may there not be here a possible working hypothesis which if followed out might throw light on this matter? May not the occurrence of healing processes at one part influence in some way or other morbid processes in the vicinity?

Again, what is the meaning of a chronic abscess? How is it that the tubercle bacilli at one time produce a quantity of tuberculous tissue, at another a cheesy mass, and at another a chronic abscess? I do not for one moment accept the view that we have in the latter case to do with a mixed infection, and that the pyogenic organisms have died out before the abscess was opened.

In connection with the pyogenic organisms also we have many problems. How is it, for example, that after an abscess is opened antiseptically suppuration at once ceases? If instead of opening the abscess antiseptically a poultice be applied, suppuration goes on and may be very profuse. But if it be opened at a time when there is free fluctuation and when it is beginning to point, and if the necessary antiseptic precautions be taken and proper drainage provided, no more pus forms, and yet when the abscess is opened it is found to contain living pyogenic organisms. We can easily understand that the subsidence of the fever and general disturbance is due to diminished absorption of toxic products. But why do not these living pyogenic organisms keep up the suppuration? and why is it that after two or three days one may fail to obtain any cultivations from the serum which escapes from the wound? If the inflamed part be opened up antiseptically, however, at an early period, just when pus is beginning to form, there is not always the same complete absence of suppuration, although it seldom goes on to any considerable extent.

Again, an operation wound becomes septic, and one naturally opens it up freely and establishes drainage; but here suppuration does not cease at once in the same typical manner as in the case of an abscess which has existed for some days. The old surgeons used to speak of an abscess being "ripe," and they allowed it to remain unopened for some days till it was pointing. They found that if they opened a deep abscess early, suppuration went on and was apt to extend. No doubt a variety of causes led to this dictum: they did not provide proper drainage; they introduced other and more vigorous organisms at the time of operation and afterwards, etc.; but do not the facts seem to indicate that, as regards the cessation of suppuration, there is some ground for this idea of ripeness? It is possible that when the abscess has attained a considerable size and the tension of the pus in it is great the sudden release of the pent-up fluid may lead to such a pouring out of serum containing antitoxic substances as absolutely to destroy the organisms present, while, the case being treated antiseptically, no fresh organisms can come in to take their place. And yet I can hardly think that that is the whole explanation.

Although it is in the department of bacteriology that the most striking advance has been made, great progress has also gone on in pathology generally, in a considerable number of cases no doubt stimulated by the results of bacteriological research, and more especially by Metchnikoff's work. The subject of inflammation has had much attention paid to it as the result of these studies, although I cannot say that to my mind it has been made any clearer. The tendency now appears to be to regard inflammation as the natural effort at repair after injury. At one time this was the view held by surgeons, and the doctrine was that inflammation was essential to healing, and in the description of healing by first intention it was stated that a red blush occurred around the wound, not so severe, however, as where suppuration takes place, and that without this red blush the

edges did not adhere. When antiseptic treatment was introduced it became evident that no inflammatory blush or other sign of inflammation was necessary for healing by first intention; in fact, it was found that wounds healed best when no visible sign of inflammation was present. I have, therefore, always taught that inflammation and healing are two different, and, indeed, to some extent antagonistic processes, and that, although in every wound the tissues in resenting the injury show the early stage of inflammation, yet if no organisms be admitted the inflammatory phenomena soon pass off, and where there is destruction of tissue a second process, namely, that of repair, begins. As I have said, in recent writings the tendency appears to be to look on inflammation and healing as parts of the same process; but, in spite of the very able arguments adduced in favor of this view, I am still unconvinced. I still look on inflammation as the mechanism which gets rid of noxious agents or neutralizes their effects, and on the healing process as that which repairs defects, whether they are caused by injury and associated with inflammation or not. In fact inflammation must be followed by repair if recovery is to take place, but repair need not be preceded by inflammation. The difficulty arises from the close association of the two processes, both of which have to do with the growth of cells, and from the fact that repair follows as soon as the inflammation begins to subside. Hence under the microscope, except in cases of acute suppurative inflammation, one sees the two processes at work side by side, and it is not a matter of surprise that they should be confounded. As a matter of fact, the more the cellular processes are investigated the more it becomes evident that there is a marked differentiation of cells as regards function.

When Cohnheim first published his observations on the emigration of corpuscles, it was thought by many that the leucocyte was everything and did everything, but it was soon evident that other cells of different origin must be taken into consideration. When Metchnikoff's theory of phagocytosis first came out, some of those who adopted it assumed that all wandering cells were phagocytes; but here, again, further investigation has shown that cells differ greatly as regards their phagocytic action. I think that a great deal of the confusion of these processes arises from the fact that expressions involving a teleological argument are very common, more especially with regard to the protective arrangements of the body. On the idea of an acting intelligence on the part of the cells, the two processes would naturally go together; but, looked on as the simple effect of an injury, they should, I believe, be regarded as independent, and the less and the shorter the inflammation the better and quicker the healing process.

A very remarkable thing in connection with these advances, especially in experimental pathology, is the enormous direct practical benefit which has already resulted to the human race; and it is sufficient answer to the antivivisectionists who oppose the use of intelligence and observation and experiment, to point to the saving of human life and the relief of suffering

which have taken place in the last few years. Since Pasteur's experiments on spontaneous generation were published, only thirty-six years have elapsed, and during that time remarkable results have been attained in treatment as the result of experimental pathology.

Scientific efforts to arrive at the truth as regards the workings of nature are necessarily slow, and must be carried on without any regard to possible ultimate practical results. When the earlier investigators studied the phenomena of electrical action, I doubt if it ever occurred to them that the result of their study would be of any practical value, certainly they could have had no idea of the revolution which the study of electricity would effect in the history of the world. When Pasteur resolved to test the theory of spontaneous generation, it did not seem likely to lead to any beneficial result; indeed, his friends tried to dissuade him from entering into what was apparently a useless investigation, and yet what numbers of human lives have been saved as the result of that work, and what incalculable benefit has accrued! It is greatly the fashion with the opponents of experimental research to demand a single instance in which an experiment has led to the discovery of a means of cure; but in no department of science has a single experiment of itself alone led to the practical result: the final observation which led to the practical result has been built up on numerous and laborious preliminary investigations and observations. And similarly, in regard to the cure or prevention of disease, the final trials on man have been led up to by numerous preceding observations and experiments. If these deluded people had their way, the result would be that experiments would be limited to man, and every one to whom a new idea occurred would apply it without any previous investigation; surely an appalling prospect, whether for physician or patient.

The practical results already obtained affect diagnosis, prophylaxis, and treatment. The diagnosis of many parasitic diseases has now been rendered certain and easy by searching for the causal organism, and I need only instance such diseases as diphtheria, tuberculosis, malaria, anthrax, gonorrhea, etc. And it is not only by the discovery of the parasite that diagnosis is assisted, but also by other effects of the organism, such as the sort of changes set up in the tissue, the reaction to products of the organism, for instance, tuberculin and mallein, etc.; and we shall hear a good deal about one of these diagnostic advances in the course of the meeting, namely, the action of the serum of typhoid patients on motile typhoid bacilli. If no other practical advance had resulted from bacteriological work, the possibility of establishing a definite diagnosis in obscure cases is surely a gain of the utmost importance, for it enables a rational prophylaxis and treatment to be instituted.

The greatest of all the advances, because so wide-reaching, has been in the prophylaxis of disease, especially in the prevention of septic disease after operations, as brought about by the discoveries of Lord Lister. By these discoveries the occurrence of sepsis in wounds made through unbroken

skin is prevented, and the chances of general sepsis in septic wounds is much diminished, and numerous lives are saved, not only in this way, but also by the fact that the Listerian treatment permits the performance of many life-saving operations which could not otherwise be attempted. In other cases, also, prophylaxis is of great value, as in diphtheria, and in Pasteur's treatment of rabies, which may properly be grouped as a prophylactic rather than a curative treatment.

Lastly, I may refer to advances in the cure of disease. In the case of diphtheria there can be no question that the antitoxin is a most potent curative agent, and that, used in the early stages, it is almost certain to cut short the disease. As regards tetanus, the evidence in the case of animals is absolutely convincing, but in patients suffering from the disease the effect is not certain, probably because we have to do with an acute illness, which runs its course before the serum has had time to act. The same may also be the case with the antistreptococcic serum, although I have great doubts of its value as a curative agent. In other instances, such as plague and snakebite, we may apparently look forward to a cure; while researches are being carried on with regard to pneumonia which may lead to valuable results; nor must I forget to mention Pasteur's system of inoculating cattle against anthrax. What are we to say about the new tuberculin? We all know how careful an observer Koch is, and the fact that he looks on it as a valuable remedy is to my mind sufficient to make it necessary to give it a careful and hopeful trial. I must say that I have always been favorably inclined to the old tuberculin, and have regarded it in relation to phthisis like iodide of potassium in relation to syphilis, and, had I been a physician, I do not think I should have abandoned it in the hurried manner in which it was thrown aside.

But it is not only in the direction of bacteriology that advantage has resulted from pathological research. Look at the advances in treatment from the use of organic fluids. As the result of observations on man and researches on animals as to the effects of excision of the thyroid gland, attempts were made to transplant the healthy thyroid gland into animals and patients in whom it was absent, and following these attempts the use of thyroid extract has ultimately come to be a recognized method of treatment. There is, perhaps, nothing more striking in medical treatment than the rapid and remarkable improvement in cases of myxedema from the use of thyroid extract.

I might enumerate many other instances of direct benefit from pathological research, such as the advances in the treatment of tuberculous diseases of bones and joints as the result of better knowledge of the nature and distribution of the disease, the treatment of appendicitis, and the investigations on peritonitis and diseases of the appendix, the more complete operations for cancer following fuller study of the mode of spread of the disease, and so on; but I have said enough to show the great importance and value of pathological research. Such results must encourage us to go on

working with all our might and without ceasing, bearing in mind that many are suffering and dying every day who might be saved if only we had just a little more knowledge of the workings of the body and the processes of disease.

But while pathologists are thus working out problems which affect the general well-being of mankind, and the solution of which can be of no personal gain to themselves, is it too much to ask mankind to furnish the means for such research? The English are looked on as a thoroughly practical people, and yet it is a very remarkable thing that England is almost the only country which does not realize the importance of scientific research, and the result is that in England, with very few exceptions, men who might otherwise have thrown much light on these matters are compelled to turn their attention to practice in order to make a living. Unless work of this kind is done how can we hope to advance with any rapidity in the treatment and cure of disease? The surgeon or physician must wait till the information of which he is urgently in need has been acquired for him by the pathologist. Such apathy can surely only be the result of ignorance. A rich man affected with an obscure or incurable malady cannot understand how it is that he fails to obtain the definite opinion or the relief which he so earnestly desires and for which he is prepared to pay any price. Surely if he understood the meaning and importance of pathological research, and that the practising physician can only apply and carry out what is taught by the pathologist, he would bestir himself to aid research in order to gather information which might be of much use to him and to others.

NOTES AND NOTIONS.

Montreal Meeting of the British Medical Association.

THE sixty-fifth annual meeting of the British Medical Association convened for business purposes in London on July 27, 1897, and the adjourned meeting for the promotion of scientific and social intercourse was held at Montreal on August 31 and September 1, 2, and 3. About one hundred and fifty persons were present at the business session, a small attendance indeed in view of the large membership of the association —some thirteen thousand—and the importance of the questions brought up for consideration. No wonder that the council feels obliged to consult the branches for expressions of opinion in carrying on the work of the association, rather than being guided by the vote of the members in attendance at the annual meeting. There were considered the functions of the council, the constitution of the association, the deference due respectively to a general meeting of the members and to the views of branches carefully ascertained, the obstetric nurses' bill, medical defence, and the disciplinary function of the association. Gold medals were presented to Mr. Wheelhouse and Sir Walter Foster, the Stewart prize was given to Dr. G. Sims Woodhead, and the Middlemore prize to Alexander H. Griffith. Two members were expelled from the association for having accepted salaried offices under the government of South Australia in the General Hospital of Adelaide, all the staff of which had resigned as a protest against the conduct of the government. An exhibition was also held by those pharmacists and manufacturers who did not consider it worth while to cross the Atlantic with their wares.

The Montreal meeting was opened on Tuesday, August 31, by an impressive choral service in the English cathedral at 12 M. In the afternoon the president of the council, Robert Saundby, M.D., F.R.C.P., of Birmingham, led the president of the association, Dr. Thomas G. Roddick, to the chair. Addresses of welcome were made by the mayor of Montreal, the lieutenant-governor of the Province of Quebec, the Earl of Aberdeen, and others. Dr. Roddick then delivered his presidential address, which will be found on page 558. On the evening of August 31 Professor Charles Richet, official delegate from the French government, delivered an address at Laval University. (See page 566.) The sections of medicine, surgery, public medicine, obstetrics and gynecology, pharmacology and therapeutics, pathology and bacteriology, psychology, ophthalmology, laryngology and otology, anatomy and physiology, and dermatology held meetings, which were well attended, on the mornings of September 1, 2, and 3. Subjects that commanded special attention were the dietetic treatment of diabetes, arthritis deformans, the surgical treatment of appendicitis, the choice of an anesthetic, the utility of quarantine, mandatory measures in

measles, whooping-cough, tuberculosis, and leprosy, hyperemesis gravidarum, vaginal *vs.* abdominal hysterectomy, treatment of insomnia and of syphilis, Widal's test, surgical gynecology in the insane, heterophoria, color perception, turbinotomy, and causation of the heart-beat. On Wednesday afternoon the address in medicine was given in Dr. Osler's inimitable style (p. 543). He was spoken of on all sides as "our Osler," for he belongs to the entire English-speaking race, whether in America, Canada, or other portions of Greater Britain. On Thursday afternoon Mr. Mitchell Banks spoke on "The Surgeon of Old in War" (see page 577), and the foundation-stone of a new building of the Montreal General Hospital was laid by the Right Honorable Lord Lister. In the evening the annual dinner of the association was partaken of at the Windsor Hotel. The scientific business was concluded on Friday, September 3, by an address on public medicine by Dr. Herman M. Biggs, of New York City. (See page 591.) Social gatherings were held every afternoon and evening during the entire week.

The annual exhibit of medical and surgical appliances, which was well arranged but poorly attended, was displayed at the Victoria Skating Rink, and the pathological museum, which contained but little of interest, was prepared in one of the pathological laboratories of McGill College. In the index of the catalogue devoted to these exhibits the names of physicians showing specimens, photographs, and slides are printed alphabetically with those of commercial houses manufacturing pills, antitoxins, and surgical appliances.

The hearty welcome, the genuine hospitality, and the innumerable courtesies shown by the Canadian hosts will long be recalled by the members in attendance from Great Britain and Ireland and by their guests from the United States.

CATTELL.

Dispensary Abuse in Philadelphia.

THE managers of the Presbyterian Hospital in Philadelphia in conjunction with the medical staff have instituted an inquiry into the extent of the abuse of its privileges by those who are able to pay. The result of a careful investigation shows that about 20 per cent. of those who are treated freely in the out-patient department are not proper subjects for charity; about half of these are willing to pay moderate fees, but apply because their friends are treated gratuitously and successfully; they have no family physician. They have no incentive to seek medical attention outside when it is so easy to get advice free of charge in institutions. A plan of personal visitation will be adopted by which an effort will be made to give services only to those who are really unable to pay for medical attendance; thus the needy poor will receive more satisfactory treatment and the objects for which the founders and contributors of such an institution maintain it will be conserved. Coöperation by other hospitals will help to remedy a great evil.

HINSDALE.

Ophthalmology in Japan.[1]

THERE are some excellent oculists among the Japanese, and it is to be hoped that the world will ere long have the benefit of their investigations. While there is plenty to do—three or four hours daily at our hospital and three or four hours in the afternoon for foreign patients, many of whom are missionaries with tired brains and defective visual apparatus—one misses the opportunity of consultation with other oculists. The fees here are considerably smaller than at home, but the cost of living is less. Japanese patients are able to pay very little for medical advice. Most of those at the hospital pay but a few cents a day, or nothing, for medicine. We have some interesting cases. A little girl with buphthalmus came under treatment seven years ago. As there was considerable tension, paracentesis of the cornea was undertaken several times, but not until after an iridectomy was performed did the tension become normal. The eye is still large, but less so than when first seen. A little American girl, now under observation, had small-pox in infancy and was badly pitted. Her right eye became enlarged. The iris is stretched to a flat diaphragm with an irregular double pupil. There is not much tension and but little vision. The optic disk is atrophic and the fundus is deeply pigmented. The child will be kept under observation a few months before surgical relief is attempted. Little can be done for her except iridectomy, which would add to the unsightliness of the eye and does not hold out much prospect of benefit to the patient.

Infantile Scurvy.

THE American Pediatric Society is making a collective investigation of infantile scurvy as occurring in North America, and earnestly requests that physicians will send reports of such cases, whether these have already been published or not. No case will be used in such a way as to interfere with its subsequent publication by the observer. Blanks containing questions to be filled out will be furnished on application to J. P. Crozer Griffith, M.D., Chairman, 123 South 18th Street, Philadelphia. A final printed report of the investigation will be sent to those furnishing cases. The good work done by this society in its collective report on the treatment of diphtheria by antitoxin will be remembered.

CATTELL.

A Double Number.

WHEN the J. B. Lippincott Company founded the INTERNATIONAL MEDICAL MAGAZINE under the editorship of Judson Daland, M.D., they fully intended to bring out the first number in January, 1892, but owing to unavoidable delays it was not issued until February. On account of the increase in size of the present number, the present publishers have decided to call this a double number, so that the sixth volume will end with the December issue. Subscribers will, of course, receive the journal for the period of time paid for.

CATTELL.

[1] Abstract from a personal communication from Dr. W. Norton Whitney, of Tokio, Japan, to Dr. Charles A. Oliver, of Philadelphia.

NOTE TO CONTRIBUTORS.

Authors will receive liberal compensation for all accepted articles after publication; or 250 reprints, if asked for on the manuscript, will be furnished in lieu of the honorarium. It is distinctly understood that all articles appearing as original matter are for our exclusive use, and are not to be reprinted or to appear in any other publication excepting the Transactions of the Society before which the paper may have been read. Illustrated papers are especially desired.

All matters of business, as well as subscriptions, should be sent to the International Medical Magazine Company, 3709 Spruce Street, Philadelphia.

Manuscripts, exchanges, and books for review should be addressed to the Editorial Office, 3709 Spruce Street, Philadelphia.

INTERNATIONAL
MEDICAL MAGAZINE.

Vol. VI.] OCTOBER, 1897. [No. 10.

ORIGINAL COMMUNICATIONS.

GENERAL IMPRESSIONS FROM SIX YEARS' USE OF TUBERCULIN.[1]

BY JAS. T. WHITTAKER, M.D., LL.D.,
Cincinnati.

ROBERT KOCH announced the discovery of tuberculin at the Tenth International Congress in Berlin, in August, 1890. The publicity of the occasion, the fame of the author, above all the defiance of the disease to all treatment hitherto, lent peculiar interest to the discovery. The suddenness of the announcement was another factor: no one had even an inkling of the work leading up to it.

The declaration of the discovery of the tubercle bacillus in 1882, though credited by many of the members of the critical audience in the Berlin Physiological Society to which it was presented, met with so much scepticism in the profession at large as to have been practically disbelieved. Most of the leading medical journals discredited it; many of them derided it. When the truth asserted itself, the disbelievers found themselves punished for incredulity. So, although the problem was harder, belief was easier on this occasion. In fact, there was a reaction to the other extreme, and more was expected of the remedy than was expressed in the modest claims of the author. This was the reason, I think, why medical men, who represent the most cautious and conservative branch of human culture, accepted the remedy at once, and began to experiment with it in a way and in cases in which the author, to use the mildest terms, had never advised it. The disappointment which followed was intense, and the expression of it was not without bitterness. In fact, we have only now reached a period when any renewed advocacy will be listened to at all.

One of my former students brought me directly from Berlin a small quantity of tuberculin, January 15, 1891, as the very first importation into

[1] Read before the British Medical Association at Montreal, September 2, 1897.

this country, and with this specimen I began the use of the remedy in the cases at the Good Samaritan Hospital at that time. These were four cases of tuberculosis pulmonum and one of scrofula, to which I will allude again.

My first use of the remedy was entirely therapeutic, and I did not begin to avail myself of the immediate action of it in diagnosis for two or three years. When it was used in this way the results were found, it is needless to say, much more striking and satisfactory. The use of tuberculin should be studied, therefore, from the double stand-points of diagnosis and treatment.

The value of it in the disclosure of tuberculosis in man was not at once rightly recognized, on account of alleged dangers in its use; but in cattle it soon met proper appreciation, and is, perhaps, nowhere more extensively and satisfactorily used than in the United States.

Aside from the objections urged by ignorant and prejudiced people not worthy of notice, four apparently valid arguments accumulated in the course of time against the use of tuberculin in man.

1. That the reaction occurs in the absence of tuberculosis. This objection has been met by the demonstration of concealed dépôts.

2. That the reaction occurs in other diseases—syphilis, lepra, actinomycosis, etc. This objection has been met by the demonstration of tuberculosis coincident with or complicating these maladies.

3. That the reaction will occur in the most quiescent case, even where the bacilli are not only concealed but encapsulated and dépôts are partly calcified. This is, of course, no objection at all, but a most striking recommendation.

4. That its use is dangerous, in that it not only awakens the disease from latent sources but also disseminates it over the body, and thus leads to autoinfection and increases the danger of infection in others. This conclusion rests upon a false premise, and confounds the *post hoc* with the *propter hoc*.

As my paper is purely clinical, I will not take the time further to discuss theoretical objections, but content myself with the repetition of a statement made upon another occasion, that I have used tuberculin every day in hospital and private practice for six years, in now nearly one thousand cases, and have never seen any kind of evil result beyond the characteristic reaction. Koch himself declares the fear of danger to be a "foolish prejudice." He has, he says, never seen "even the slightest intimation of any mobilization or transmission of tubercle bacilli" in the use of tuberculin as a diagnostic agent in over one thousand cases, and this experience, he thinks, "should put the diagnostic value of it in man upon the same plane as in animals." My own use of tuberculin, I ought to say here, has been nearly exclusively for therapeutic and only exceptionally for diagnostic purposes.

In a paper read before the Association of American Physicians in May, and published in the Transactions, I reported a number of cases, doubtful

and obscure, in which the diagnosis, positive and negative, so far as tuberculosis was concerned, had been easily established, and mostly after failure with other means, by a test dose of tuberculin; thus, in cases of neurasthenia, night-sweats, joint-disease, laryngitis, pulmonary tuberculosis, peritonitis, fistula, etc. Since this report I have had a striking illustration of the penalty which attaches to over-confidence in diagnosis and neglect of using the most approved method of study. This will be the only case which I shall report. On June 10 I was called in consultation by Dr. D., a good surgeon in Cincinnati, to aid in the diagnosis of a case of enlarged glands in the neck in a patient of his, a woman, aged 67. The glands had begun to grow three months before, and now formed a good-sized mass under the angle of the right jaw, extending down behind and below the sterno-mastoid muscle. There was some pain, and within the past few weeks there had been slight fever. The glands were deep-seated and hard. The patient had enjoyed good health hitherto, and had no other discoverable disease. The rapidity of the growth, the presence of pain, the absence of any affection of the lungs, above all the age of the patient, led us to declare a diagnosis of carcinoma, probably sarcoma of the cervical glands, and to advise immediate extirpation. The operation was tedious and bloody (as had been expected), and the patient succumbed in three weeks. I learned these things by letter from the surgeon, together with the fact that the glands, upon microscopical and bacteriological examination, turned out to be tuberculous. Now, although extirpation is often the best treatment of an adenopathy of this kind, I should myself, with a true knowledge of the disease, have advised against an operation in this case at that time.

The mode of action of tuberculin, to which I allude merely from a clinical stand-point, has met with various explanations. Certain it is that, together with leucocytosis and fever, a sharp hyperemia is developed, extending over the entire domain affected, and in this process toxins are formed or are liberated which produce the characteristic reaction and give partial immunity to the poisonous products of the tubercle bacillus. The immediate benefit which nearly all patients feel is due to this immunity. The proper principle of treatment consists in pushing the development of this toxin as rapidly as possible, this side of extreme reactions, before tolerance to the tuberculin itself is established in the body. Most of the protection of the body against the action of poisons is based, as we know, upon tolerance, which is probably secured by increasing the antitoxic action of the serum of the blood. The patient affected with tuberculosis is not fatally poisoned by the products of the tubercle bacillus because of tolerance to the products of it begotten in their slow development. When these products are developed too rapidly, the body is overwhelmed and succumbs. But the tolerance to tuberculosis, as a rule, is so great that individuals live for years and decades of years, and often recover entirely. The body becomes adjusted to the effects of the poison, and sometimes

shows in this process remarkable changes. Thus, the disposition may be actually improved by it. It was Klebs, who makes such close and curious observations, who first spoke of the singular sweetness of disposition and loveliness of character sometimes seen, especially in women the sufferers with slow phthisis. Men, it seems to me, are rather made more irritable. The true principle of treatment with tuberculin is to secure the action of it before tolerance to it is established, for as soon as it is tolerated it loses its effect. Unfortunately, there is, as a rule, not time to secure immunity to the products of the tubercle bacillus before this tolerance to tuberculin is established, and so the benefit experienced at first is lost in the later treatment. For with tolerance the toxin ceases to increase the antitoxic action of the blood, and any continued use of it after this time seems really to lessen it. So, when the tuberculin fails to do good and the disease reasserts itself, the use of the remedy should be stopped. Time should then be allowed to elapse, several weeks being required in most cases, and when the tolerance is lost the treatment should be begun again. Thus, the successful treatment of tuberculosis takes time, a long time, months and years, about as long as does the successful treatment of syphilis, which is usually a matter of years. The physician who expects to cure a case of tuberculosis in a few weeks will, of course, soon become discouraged, and will probably join the ranks of medical men who denounce and decry the means.

The first dose for the cases of lightest infection (suspected) should be five milligrammes, the second ten milligrammes, or one centigramme, the third two centigrammes. These doses may be given on succeeding days, or, better, every other day, preferably in the evening, that the temperature records may be properly observed on the following day. Failure to get reaction from three tests excludes concealed tuberculosis. The crude tuberculin diluted one hundred times, preferably with a one-half per cent. solution of carbolic acid, makes, of course, a one per cent. solution, of which one interspace of the Koch syringe represents one centigramme. One interspace of this one per cent. solution diluted ten times makes a milligramme. For therapeutic use I begin with one-tenth of a milligramme.

I will now be more brief in my remarks upon the therapeutic use of tuberculin. In my first use of the remedy I was able to adhere rigidly to the rules laid down by Koch, but I was not able to select the cases or to limit myself to the first stages of the disease, the phthisis incipiens. In fact, every one of the cases of lung disease was in what is commonly called the second stage, phthisis confirmata, and one of them was so far advanced as to constitute a phthisis consummata. The remedy was used in this case in infinitesimal dose simply *ut solaminis causa.*

I do not propose in this brief summary to vex the society with any details of cases, but I may say here at once that the case of scrofula ultimately—*i. e.*, in the course of two years—made a good recovery, while the cases of phthisis pulmonum all died in from four to six months. It was

impossible not to feel disappointed and somewhat discouraged at the result. But, on comparing subsequently the course of similar cases treated with tuberculin with other cases, it was seen that the progress of the disease was slower in the first cases, for some improvement pretty much always sets in at first. We had, however, nearly uniform results to report in hospital practice—an improvement for a time, with subsequent continued progress downward, interrupted with many stages of quiescence and occasional temporary gain. In explanation of the temporary improvement, it became plain to see, as cases multiplied, that, after making due allowance for the all-powerful influence of suggestion, and some for the better hygiene of hospital life, there was still room for much to be granted to the specific treatment.

It was a long time before the reason of the continued progress of the disease was ascertained, but it became apparent at last, with continued examinations of the sputum, that direct product and derivative of the disease, the closer examination of which had led to the discovery of the tubercle bacillus—the luminous epoch in the history of the disease. But all attention had been directed to the detection of this bacillus in the sputum hitherto, to the neglect of other micro-organisms. As examinations multiplied in competent hands, it was soon seen, or perhaps I should say the fact already known became better appreciated, that the new advances or relapses marked by chills and sweats were due to invasions of other, especially of the pus-producing, micro-organisms, and that the disease had passed beyond the domain of tuberculosis into the wider realm of sepsis. It was at this time that the school of Koch proposed to call the see-saw temperature of hectic the "streptococcus curve." The reason of the failure of tuberculin in the further course of the disease now became apparent. It was not to be expected that tuberculin, a product of the tubercle bacillus, would inhibit the growth of or destroy the influenza bacillus, the diplococcus, or the pyogenic micro-organisms. The truth is, the great majority of cases in hospital practice have already advanced beyond the stage of pure tuberculosis. They are cases of mixed infection, or sometimes of secondary infection, and belong not so much to tuberculosis as to septicemia.

The results of the use of tuberculin in private practice are more encouraging. In ordinary house practice cases are encountered, of course, in every stage, and the majority, because of the long duration of the disease, have advanced to the second stage; but the hygienic environment is better, as a rule; that is, there is more breathing room, more out-door life, including here the advantage of change of climate, more comfort in every way; as a rule, to which there are many exceptions, there is less auto-infection, and, of course, less homesickness and all that without saying goes with it to gregarious man. I had the influence of this factor impressed upon me once by the remark of a big, strong-looking man, who came back from Colorado too soon, with the apology, "Doctor, I am going to stay home; I had as lief be buried under the ground as on top of it."

But the advanced cases in private practice in the long run took the same course. The disease after a temporary check would reassert itself, with chills, often of origin sudden and inexplicable, with hectic, night-sweats, and final dissolution. But every now and then there were agreeable surprises. The progress of the disease would be checked for a longer time, or the whole condition would be raised to a higher level—to that of several months or of several years before. In these cases the bacilli would diminish and sometimes disappear altogether, and the gain in spirits, which is quick in phthisis, the *spes phthisica*, would exceed the gain in weight.

Just in which cases this gain would occur or in which it would fail to show itself could not be foretold. As in so many other things, it was necessary to try to find out. Sometimes it would be impossible to know whether the improvement was really due to the tuberculin or to conjoined treatment; but, as time advanced and cases multiplied, the feeling would grow that the cases treated with tuberculin off and on, more especially for a long time, and judiciously—that is, with the same caution as in the use of any other agent in the materia medica—that these cases did the best. It was always easy enough to study control cases in patients who were themselves or had been by their physicians prejudiced against the use of it. So that, when the diagnosis was clear—as established in a plain case by the physical signs, in a doubtful case by the discovery of the tubercle bacillus, or in a still more doubtful case by a test injection of tuberculin —I made it a practice to use it tentatively in every case (with the consent of the patient, of course, never without it), and then continue with it or abandon it according to the results.

Some of the differences in results could be pretty definitely attributed to the kind or degree of the mixed infection, some to the localizations elsewhere in the body, and some to the site of the original deposit. For instance, influenza cases—*i. e.*, cases complicated by influenza—do badly, as a rule. Caries of the vertebræ, of the tarsus, or of the carpus makes ugly complications, while deposits in the pulmonary veins or thoracic duct or irruption into these vessels inundate the body to produce phthisis florida and miliary tuberculosis. We recognize these cases often after a very short examination, and appreciate at once their ominous character. The continued feeding of the body from these dépôts makes futile every kind of therapy until a more exact localization may be effected, perhaps by some kind of penetrating light, and destruction or extirpation become possible by galvanotherapy or by the knife. At the present time they constitute the despair of medicine, and the use of tuberculin is actually contraindicated in them. I know of no other contraindications.

The best results are got in office practice; in the first place, in the way of diagnosis. It is a great satisfaction to be able to clear up a concealed case and to declare an exact diagnosis of a disease treated hitherto without a diagnosis or for something else. Thus, an obstinate or frequently recurring dyspepsia, an amenorrhea, a neurasthenia, an anemia, a rheumatism,

an adenitis, a little low fever (to say nothing of acute cases of chills, night-sweats, catarrhs, and coughs), may have their true nature revealed in this way. These are the cases (aside from the chills and fever) in which the treatment furnishes the best results. Tuberculin gives good results also in childhood. Children react favorably to tuberculin, much more so than adults, so that the so-called apex catarrh of childhood will often clear up and disappear in them within three weeks.

Aside from these cases, the treatment must be persistent and good judgment must be used in dosage: rather too little than too much. I have never seen any bad results from the use of tuberculin, because I always endeavored to secure a slow tolerance, so that individuals who react at first to a few milligrammes become later insensitive to one hundred times as much,—in fact, at last to one thousand milligrammes. The evils ascribed to it I believe to be due to the disease itself, for I have seen them oftener before the use of it. But it is easy to conceive that the patient would suffer under excessive reactions, and that repeated excesses might do permanent harm. But *ex abusu non arguitur ad usum*. It is a maxim of the law, good also in medicine, that we may not from abuse argue against use.

The highest value of tuberculin is the diagnostic value, which is supreme, and which enables us to distinguish the disease at the start as a tuberculosis, before the development of sepsis or other complications which go to make up that composite picture we call phthisis.

THE TREATMENT OF GOUT BY NATURAL MINERAL WATERS.[1]

BY CHARLES C. RANSOM, M.D.,
New York.

In studying the literature of gout one cannot but feel how sad a commentary on the progress of medical science is the fact that the theories as to the causation of gout held by the ancient Greek writers, even as early as Hippocrates, three hundred and fifty years before the Christian era, were quite as reasonable and susceptible of proof as are those of the present day.

Hippocrates considered the disease due to the retention of *humors* in the system, and advised purging and the application of cooling lotions or cold water. Substitute the name uric acid for humors, and you have the most modern theory and treatment of to-day.

Following Hippocrates, various ancient writers, such as Galen, Seneca, Aretæus, Cælius Aurelianus, and others, showed their keen powers of observation in studying disease by ascribing to the growing luxurious modes of living the production of the gouty condition.

[1] Read before the American Climatological Association at its meeting in Washington, D. C., May 6, 1897.

While we also are cognizant of the fact that luxurious habits, lack of exercise, and excesses are predisposing factors in the causation of the gouty condition, we are as ignorant as they were as to the true nature of the *materies morbi*, and must perforce say with Aretæus the Cappadocian, "None but the gods can truly understand it."

Notwithstanding the fact that a diversity of opinion exists as to the true nature of the affection, nearly all writers are unanimous as to the predisposing factors, and there is consequently not so great a difference in the objects sought by treatment as one might naturally expect.

To stimulate functional activity, and thereby increase metabolism and the excretion of morbific matters, and to correct vices of living, must be our aim in the treatment of this disease.

It will be readily seen how a sojourn at a properly selected watering-place meets all these requirements. The choice of such a place is very largely a matter of personal opinion with the physician, and the different classes of waters have their various advocates.

There are many things to be considered in the selection of a watering-place for gouty patients. As a rule, such patients are nervous and irritable, and need a pleasant environment where they can be occupied and diverted and lead an out-of-door life, while their treatment is made a pleasure rather than a drudgery. The fact must also be borne in mind that results of treatment may be obtained from the hydrotherapeutic stand-point alone, irrespective of the mineral ingredients contained in the water used. The analysis of the water is, therefore, not alone sufficient in the selection of such a place, for unless the facilitates for administering the waters are adequate, and the details of the bathing procedure are carefully carried out, the treatment, instead of doing good, may be productive of serious ills. While I believe thoroughly in the internal administration of mineral waters, as will be seen later, to my mind the most valuable mineral waters in the treatment of this disease are those that are used externally in the form of baths.

It is hardly conceivable that the chemical ingredients of most natural mineral waters are held in them in sufficient quantity to produce *per se* any marked curative effects upon the economy when taken internally. This is especially true of the alkaline mineral waters, the principle of whose action is to render alkaline the blood and the secretions. I do not wish to be understood as altogether decrying the use of alkaline waters. I believe that they have some value in augmenting the secretions and stimulating functional activity, but I do not believe that they alone should be depended upon to effect a cure, but should only be used as an adjunct to the bath treatment.

As my experience with the mineral baths has been especially in the use of the waters of Richfield Springs, which are sulphur waters, I naturally feel that this class of waters is unsurpassed in the treatment of the gouty diathesis, and I may be justified in my opinion by the most excel-

lent results which I have obtained from their use—results which, so far as I can learn, have not been surpassed at any springs. In considering the treatment of gout by natural mineral waters I shall simply relate my personal experience gained from the observation of a great many cases which have come under my care during the past ten years at Richfield, and give you briefly a *résumé* of the methods which I employ in the application of these waters. The form of bath which we are in the habit of using in this class of cases at Richfield, and which seems to answer best, is the immersion or tub bath. The dose of the bath, if I may be permitted the expression, is regulated by its temperature and duration. The temperature will be found to vary with different subjects from 96° to 108° F., and the duration from five to fifteen minutes. The object sought in the application of the bath is to give such a bath as will produce to the fullest extent the physiological effect without exceeding it, for then depression would be sure to follow, and harm might result.

In determining the proper dosage much care must be exercised, for different patients vary very much in their reaction to the bath; and it will also be observed that the same individual will vary at different times.

A large experience, then, is necessary to conduct properly the bathing procedure, and careful and frequent observation of the patient must be had. We usually begin with a bath at a temperature of 98° F. and duration of eight minutes, followed by complete rest of an hour in bed. This bath is taken three days in succession, and preferably in the forenoon, two and one-half hours after a light breakfast. After the third bath the patient reports, and we note carefully the effects of the bath as seen by the sensations of the patient during and immediately after the bath: whether or not there is depression or fatigue, whether there is exhilaration, how long these sensations last after the bath, if after the rest in bed following the bath there is any fatigue or depression, if there is a sensation of fulness in the head or oppression of breathing during the bath, excessive perspiration following the bath, etc. From these subjective symptoms and careful physical examination of the patient we determine whether it is wise to increase or diminish the dosage, or to continue it as we have begun. These observations must be made every three or four days throughout the entire course of treatment, in order to insure the best results.

It is the custom of some physicians in all cases in which the baths are found to be depressing to order the bath every second or third day instead of modifying it. To my mind, this is very bad practice. If a bath is so depressing that a patient can take it only once in three days without ill effects following, it is never a proper bath for that patient. The bath should be modified by lowering the temperature and shortening its duration, and it is exceedingly rare that a bath cannot be properly adapted by these means. A bath at 96° F. for five minutes or even less will often accomplish everything desired, although to some it may hardly seem to be worth the while.

It will be found that nearly all patients taking a course of baths will suffer from a general systemic disturbance usually within the first week. The symptoms manifested in this condition are those of general malaise, headache, anorexia with coated tongue, and either constipation or a slight diarrhea.

This is the condition described by writers on balneology as the "bath fever," and shows to the most skeptical that the medicinal bath is not a simple washing process, but is capable of producing as marked systemic effects as the ingestion of a drug.

At this time I omit the bath for a day or two. This, together with the administration of a little calomel, always suffices to correct the condition. From this time on, during the entire course, it is rarely necessary again to interrupt the bath. The course of baths usually consists of twenty-one, but this number is purely arbitrary, and frequently it is desirable to give more, though less than twenty-one is not enough to produce good results.

As I have already said above, I believe thoroughly in the internal use of water in connection with the baths, and it is my practice at Richfield to order the drinking of considerable quantities of water during the day. Free administration of a chemically indifferent water at proper periods diminishes the formation of uric acid and increases the secretions. The most potent agent in the internal use of mineral waters is the fluid, a property which is common to them all, and I therefore lay no particular stress with my patients upon the kind of water used. I usually order six glasses of water to be taken at stated intervals during the day. I often find it of advantage to prescribe some of the water hot. This is particularly the case with those who suffer much from indigestion. In these cases three of the six glasses are taken hot, one before each meal, not less than an hour before, and the stomach is thereby better prepared for the meal which is to follow, and in many instances the discomfort after eating is quite removed.

Next to the bath, regular and systematic exercise is of great importance in this condition. When it is possible active exercise out of doors in gradual and increasing amount is ordered. The form in which exercise may be taken is a matter of choice with the individual, but let it be borne in mind that if, for instance, walking is the form chosen, a short, brisk walk of even five minutes is of far more value than a half-hour's slow and indifferent stroll. Bicycling, horseback riding, golfing, and various other sports which carry with them a considerable amount of out-door exercise are encouraged.

In conjunction with active exercise or without it in those cases in which active exercise would entail too much fatigue, passive exercise is ordered in the form of massage or Swedish movements. Special forms of massage are adapted to those cases in which deformities and the like exist.

Diet is another most important element in the treatment of the gouty condition, and in no part of the treatment does individualism play so important a rôle. The fundamental principle in dieting this class of patients

is to build up and invigorate the perverted nerve centres, increase functional activity, and thus bring nearer to the standard of health the nutritive and metabolic changes. The needs of each individual, then, must be carefully studied, and while some restrictions should be placed upon them in regard to certain classes of foods, a so-called low diet will be found in many instances to be most pernicious, and our best results will follow a generous plan of feeding.

At Richfield patients are allowed red meats and all others with the exception of veal and fresh pork, at least once a day, and twice if desired. Potatoes and the vegetables that grow under ground are prohibited, as well as the use of sweets. Breadstuffs are somewhat restricted, but butter and other fats are allowed.

As to beverages, malt liquors and sweet wines are forbidden absolutely. If patients are in the habit of taking wine, and their condition needs a stimulant, there is no objection to a light wine, or, better still, Scotch whiskey with soda.

In conclusion, I wish to say that in presenting this paper to you I have not attempted to tell you anything especially new in regard to the treatment of the gouty, but have endeavored to emphasize the importance of the proper administration of medicinal baths in this connection, and to make more clear to those of you who have not had the opportunity of observing this form of treatment, the *rationale* of the bath.

A CLINICAL STUDY OF TACHYCARDIA AND ITS RELATION TO UREMIA AND GRAVES' DISEASE.[1]

BY ROLAND G. CURTIN, M.D.,
Philadelphia.

During the last three years I have had several cases sent to me which appeared to the attending physicians to be cases of simple irritable heart, in some of which the tachycardia was, however, only a prominent symptom. Dr. Sansom, of London, defines tachycardia to be a condition of the heart causing it to beat at the rate of ninety or more in a minute.

About two years ago I was called by Dr. John W. Dick to see a woman, thirty-five years of age, whose history was as follows: There was nothing unusual observed except that there was considerable anasarca during the last three months of pregnancy, and during the last two months she had an enormously voracious appetite. The labor was tedious. After vain efforts to deliver her instrumentally, version was resorted to, and with

[1] Read before the American Climatological Association at its Fourteenth Annual Meeting, at Washington, D. C., May 4, 1897.

great difficulty a dead child was born. The woman had but recently come from a distant part of the country, and the doctor had had the opportunity of seeing her only twice prior to her confinement. Before labor there was no suppression of urine, nor were there any symptoms of uremia. Examination failed to show the presence of albumin. After labor she was catheterized, but no urine was found in the bladder. I saw her two days after delivery, and learned that since twenty-four hours after labor her pulse had been 140. This tachycardia came on with the suppression of urine, associated with constant vomiting, and continued with boulimia until death, which occurred sixty hours after delivery. Her skin and breath had a strong urinous odor, but there was no evidence of septicemia. Her mind was perfectly clear, and there was no tendency to convulsions.

In this case the poison appeared to fasten itself upon one or more nerves of the heart, stimulating them to such a degree as to wear the organ out, causing death from exhaustion.

M. N., female, aged forty years, and the mother of four children. She had always been healthy, and nothing unusual occurred during her first three confinements. One year after she was delivered of her fourth child she came to Philadelphia, with the history of having had three convulsions before and one after an instrumental delivery. During the convulsions, which were very long and severe, she had marked albuminuria. After the first convulsion she was entirely unconscious. Blood-letting was not resorted to. Her face was puffy, and she had all the evidences of anemia. During one of these severe convulsions it was noticed that there was an unusual pulsation at the root of the neck, in the region of the lower portion of the right common carotid artery, which has continued ever since. When under excitement she sometimes has a choking sensation, and during the last four weeks has had some dysphagia. Her heart has been rapid for the past year, running from 100 to 120. I examined her urine and found it to be free from albumin. The pulsation tumor in her neck proved to be an aneurismal dilatation of the right common carotid artery, extending to about two inches above the clavicle. It is probable that one or more coats of the artery gave way during the stress of the severe eclampsia.

At the time she was placed under my care her pulse was 108. Her heart was found to be somewhat hypertrophied, but free from murmurs. I placed her in bed with a restricted diet, and gave her potassium iodide, 4 grains, and fluid extract of veratrum viride, gtt. ij, four times a day. In three weeks the heart was beating sixty-eight times in the minute, and the pulsation in the neck had wonderfully decreased. At this time she became restless and left for her home. As soon as she arose from her bed and walked around her pulse ran up to about eighty.

In this case the uremic condition seemed to start the heart into rapid action, continuing till hypertrophy of the heart set in, which, with an excitable nervous condition of the system and the too active life she was leading, continued the tachycardia after the subsidence of the albuminuria.

These two cases seem to have been first caused by a local toxic irritation of the nerves of the heart, rapid action following as the immediate result.

In other cases of uremia I have noticed various isolated manifestations, such as headache, vertigo, vomiting, and nausea, and in one case under my care there seemed to be an excitation of the nerves of respiration, the only nervous symptom present being rapid, gasping breathing. No disease of the lungs or pleuræ was found after death.

I will now refer to a group of cases in which the rapid action of the heart, of a more or less constant character, was almost the only symptom—*i. e.*, cases of undeveloped Graves' disease. You all know that the first of the so-called three cardinal symptoms found in this disease is generally palpitation of the heart, associated usually, but not always, with a marked rapid action. I have completely tabulated fifty-five cases of Graves' disease, and find that palpitation was the first and for a time the only symptom that was noticed in thirty-four instances, and in some it was years before the other symptoms presented themselves. In a number of cases so tabulated the rapid action of the heart was first discovered by the atttending physician, it being not at all perceptible to the patient.

I will first present to you the following histories, and will conclude with some general remarks concerning them.

I was asked by Dr. McDowell to examine a woman, thirty years of age and the mother of one child, to determine whether or not she had an aneurism of the abdominal aorta. I found considerable epigastric pulsation, but no other evidence of aneurism. Upon further investigation I found that she had a morning temperature of 99° or more, and a pulse ranging from 104 to 116, the first sound of the heart murmurish and markedly softened and short. The character of these heart-sounds caused me to examine her thyroid gland, which I found to be slightly enlarged. I saw her two weeks later, and this enlargement had considerably increased. She had nervous tremors and was easily excited, but there was no suspicion of prominence of the eyeballs.

Another patient was sent to me from a limestone region in the interior of Pennsylvania as a case of simple irritable heart. She was thirty-four years of age and the mother of three children. Two months prior to her visit to me her heart became excited, the pulse ranging from 110 to 120. Her digestion was disordered, and she had the muscular tremors so common in Graves' disease. She was very excitable, and her doctor feared insanity, as there was a strong hereditary tendency in that direction. On examination I found a faint, soft, mitral systolic murmur and a considerable enlargement of the thyroid gland, which she told me had begun slowly to increase in size between the ages of fifteen and sixteen, when her menses were first established. The right eye seemed a trifle more prominent than the left, but neither was markedly abnormal. I had seen two cases of Graves' disease, who were related to her mother, and I found that there were four in her father's family also.

Mrs. E. H., the mother of three children. Between the ages of twelve and thirty-five years she had marked attacks of palpitation with tachycardia, which she called "heart bumps." She had a slight, mitral systolic murmur and an action of the heart that suggested to me Graves' disease. This suspicion was increased as I knew that her mother and only sister had it unmistakably. I watched her for a number of years with great interest. At the age of thirty-five years one of her children sickened and died, which depressed her very greatly, and immediately following this her thyroid gland began to enlarge rapidly and her eyes became prominent. Prior to this she had tremors of the muscles and was exceedingly nervous, and subsequently, when she was lying in a depressed, nervous condition, her heart became intermittent.

Mrs. F. C., aged forty-three years; no children. Her husband was an old syphilitic subject. There was no history of exophthalmic goitre in the family. For the past ten years she has had a sense of palpitation whenever disturbed, either emotionally or constitutionally. These attacks, accompanied with shortness of breath, would be felt principally when ascending stairs or moving about hurriedly. Seven years later, after an attack of influenza, during which there was a good deal of violent coughing, her thyroid gland began to enlarge, and she remained in this condition for two years. During the first year it was constantly varying in size, but lately it has not changed much, if any. She is anemic, has muscular tremors, and is exceedingly nervous and excitable, but the eye symptoms are now negative. This last condition being absent does not shake my belief in its being an undeveloped case of Graves' disease.

The following case was in the wards of the Philadelphia Hospital in 1884. He was forty-three years of age, born in Ireland, and had followed the sea until two years ago, when he went to work in a stone quarry. In 1872 he was struck in the back of the head, and probably sustained a fracture of the skull, as a distinct impression could be felt at the seat of the blow. Last April, while being treated at the hospital for a fracture of the leg, he began to suffer from severe attacks of vomiting and palpitation, without any apparent cause. These attacks lasted till six months later, at which time he came under my care. He was a strong-looking man, somewhat inclined to corpulency. His respiration was rapid, and his face red and congested, although he was quite anemic. His only comfortable position in bed was either on his face or back; any movement toward his right side gave him severe pain over his heart, and if he attempted to rest on his left side the palpitation was unbearable. The pulse was rapid, ranging from 120 to 130 per minute; respiration 50. The tongue was small and covered with a slight white fur, and there was a slight enlargement of the thyroid gland. His digestion was very poor, and for months he had lived on a diet of boiled milk, being unable to retain anything else on his stomach. He had a pulsation in his epigastrium which was so marked that when I took charge of him he was labelled as a case of aneu-

rism of the abdominal aorta. When standing he became dizzy and required support to keep himself from falling. After a careful examination I found that the abdominal aorta pulsated abnormally, but there was no evidence of its being dilated. The two sounds of the heart were very much alike, the first being greatly shortened. No cardiac murmur could be detected. The eyes were normal, and no enlargement of the thyroid was then present, but a few days later the gland became perceptibly enlarged and both eyes slightly prominent. Had he died before these symptoms presented themselves the case would probably never have been properly diagnosticated.

These samples have been culled from a large number of histories as more particularly illustrating rather unusual cases, in that they had the palpitation and excited heart long before the other symptoms appeared, and some of them were diagnosticated erroneously as simple essential tachycardia.

I also have the history of a case in which the pulse ran from 111 to 130, but the heart was free from murmurs. She was anemic, had muscular tremors, prominent eyes, and was nervous and apprehensive.

This case illustrates the absence of thyroid enlargement—one of the triad of symptoms usually found in this affection.

Another case had, about puberty, nearly the same symptoms, the only difference being that she had the enlarged thyroid, while her heart was not particularly affected, showing no signs of palpitation for a long time.

In a paper read at the second Pan-American Medical Congress, held in the City of Mexico, in November, 1896, on "Heredity as a Primary Factor in Graves' Disease," I gave statistics collected from thirty-five families in which ninety-seven cases had occurred. Since that time I have added four more families, making a total of 113 cases in thirty-nine families.

TABLE SHOWING THE SALIENT POINTS IN THE DIFFERENTIAL DIAGNOSIS OF THE TACHYCARDIA OF UNDEVELOPED GRAVES' DISEASE AND SIMPLE IRRITABLE HEART.

Undeveloped Graves' Disease.	*Simple Irritable Heart.*
Anemia common.	Anemia rarely if ever present.
Muscular tremors common.	Muscular tremors not common.
Fever generally accompanies each paroxysm of palpitation.	No fever with paroxysms.
Appears generally in weak, nervous women.	Oftenest in muscular men.
Rarely in tobacco users.	Commonest in tobacco users.
Slight, soft, quick, systolic murmurs, or a murmurish sound at the mitral orifice.	No murmur.
Heart-sounds short and muffled.	Short, sharp tack-hammer sounds.
Follows mental or other shocks.	Follows overwork or overstrain.
Graefe's sign may be present.	No such sign.
Prominence of one or both eyes.	Eyes congested sometimes ; not prominent.
May have a soft, slightly enlarged thyroid, varying in size.	Thyroid unaffected.
Hereditary.	Not considered hereditary.

The value of heredity in the diagnosis of slowly developing cases of Graves' disease is very important to recognize, as taken in its early stage the disease is much more amenable to treatment than it is after having become chronic. This is well illustrated by the case of Mrs. E. H., reported in this paper. I suspected the true nature of her trouble years before its perfect development, owing entirely to the fact that I knew her mother and only sister had previously had unmistakable symptoms of exophthalmic goitre.

Discussion.

Dr. Newton: I was struck by the similarity of the cases described by Dr. Curtin and some cases of prolonged heat-strokes. We have not the time now to go into this matter, but it would be very interesting to do so. The irritable and unstable nervous system and weak, irregular, cardiac action are similar in the two conditions.

It has been found that a man in a hot bath can stand a very high temperature if the heat is not applied for too long at a time. After being exposed to this heat for some time the system establishes an artificial form, so the man will sweat if the temperature of the water is raised even a quarter of a degree and shiver if it is lowered to the same extent. I mention this fact to show the great adaptability of the nervous system. Man can gradually accustom himself to almost any temperature. We know that North Americans can endure a tropical temperature if they submit to the conditions of life observed by the people who live there; but they must be people with sound nervous systems and good heart action. In other words, they must have that elasticity which will enable them to endure change, and even considerable shock, without serious detriment to their bodily functions. I think, as I said before, that the condition of the system is similar after sunstroke to its condition in such cases as Dr. Curtin has described as undeveloped exophthalmic goitre. In his cases the resiliency of the nervous system had, for some reason, been lost. So, after a shock or an injury, or after certain diseases, as, for example, after diphtheria, the nervous mechanism is often thrown completely out of gear. It may recover its balance and the bodily functions go on as before, but such cases present, as a rule, very serious problems to the clinician.

Dr. Solly: I am sorry that there is not time to go into the subject at length. I cannot tell whether the nervous system is in fault in producing this disease or whether the climate is so; but in the twenty years that I have been in Colorado I have seen a number of cases of Graves' disease, and my general impression is that the climate there is not unfavorable. I have seen decided improvement in patients there, so I do not think patients must necessarily leave high altitudes because of having this disease; but any undue exertion is more likely to affect them unfavorably there than at a low altitude. I have a case at present of a young woman who has chronic phthisis. Her case was not quite cured, but it was in arrest, when she

took la grippe, which was followed by Graves' disease. Her pulse ran up to 130 and 140, and the exophthalmos was very marked. She had been overdoing the matter of exercise. I put her to bed, gave her calomel, digitalis, and iron. She is now up and taking moderate exercise. Her pulse is not excessive. The question arose of sending her away. Of course, if it becomes necessary I shall do so, even at the risk of making her chest worse.

Dr. Curtin: The subject of the climatic treatment of this disease was discussed seven years ago before this Society, at which time I read a paper upon "The Climatology of Graves' Disease," and it was then decided that a person would be more likely to have this disease at a high than at a low altitude.

I think that rest is more important than medicine. The fact that persons have a paroxysm from some cause which gradually passes away, no matter what we do, shows sufficiently that often the medicine used is of very little value. If the medicine is given and the patient improves, I do not think it is always due to the drugs, but to the gradual natural subsidence of the disease. In fact, I am satisfied that patients sometimes get better in spite of the treatment. Quietants to the nervous and circulatory system with heart tonics do good and hasten relief, or even may cure with continued quietude of body and mind.

RENAL DISEASES AS AFFECTED BY CLIMATE.

BY I. N. DANFORTH, A.M., M.D.,

Professor of the Principles and Practice of Medicine and of Clinical Medicine in the Northwestern University and Woman's Medical School, Chicago, Ill.

THE relations of climate to renal diseases seem to have attracted but comparatively little attention, although the subject is one which obviously has a very great practical importance. It is quite remarkable how little is said upon the subject of climate as a cause of or remedy for renal diseases in the various text-books and monographs wherein Bright's and allied diseases are discussed. Yet they are not altogether silent.

R. Saundby[1] attributes the prevalence of Bright's disease in "Holland, Denmark, Scandinavia, and on the shores of the Baltic, to common predisposing cause—a cold, moist climate," and Garrod explains that "chilling the skin increases the formation of uric acid, while it probably gives rise to other alterations in the blood by diminishing elimination."[2]

H. B. Millard[3] states, with reference to the "Causology" of chronic croupous nephritis, that "it appears to be the same as that of many cases

[1] Renal and Urinary Diseases, p. 89.
[2] Op. cit., p. 119.
[3] Bright's Disease, p. 94.

of chronic interstitial nephritis. The most prominent of these causes are undoubtedly atmospheric conditions, damp, cold, unfavorable climate, check of perspiration, etc." It will be observed that this author regards "unfavorable climate" as capable of causing both croupous and interstitial nephritis.

Grainger Stewart is silent as regards climate as a cause of renal lesions, although he recommends patients to winter in the "South of Europe, in Algiers, or in Egypt, and practitioners in high altitudes, such as Davos, find that renal cases should not try treatment there."[1]

W. H. Porter has nothing to say regarding climate as a cause of or remedy for renal affections. C. W. Purdy[2] says, "All renal diseases are influenced by vicissitudes of temperature and humidity of the atmosphere, and these are found most injurious in the cooler ranges, such as the temperate zone between the fortieth and sixtieth parallels." Furbringer does not attribute much influence to climate in the causation of Bright's disease. J. Tyson regards a malarial climate "as a recognized cause of chronic parenchymatous nephritis." Charcot and George Johnson are both discreetly silent in respect to climate as a cause of or remedy for Bright's disease. W. Howship Dickinson, in his classic work on *Albuminuria* (p. 280), presents the most extended article on "Climate in Relation to Renal Disease" with which I have met. His article is based upon the *Army Medical Reports* of Great Britain. "Our military posts" (*i. e.*, those of Great Britain), says Dickinson, "are ranged like sentinels around the world; and extending from the Arctic circle to the equator, and thence far towards the south pole, they are exposed at the same time to every climate and every season. To these local influences we subject, with all the exactitude of scientific experiment, bodies of men of the same race, age, occupations, and habits, each with a staff of trained observers, and a uniform system of recording the issue." The author finds that the "equatorial districts of Ceylon, Japan, the greater part of India and China, all give a large proportion of renal disease;" but, as might be expected, it is mostly of the *amyloid* or *lardaceous* variety—degenerative, rather than inflammatory lesions, being far more common among Europeans transported to tropical regions. It is noteworthy, also, that syphilis, one of the most frequent causes of amyloid kidney, is especially prevalent in the tropics—a fact which detracts somewhat from climate *per se* as the essential cause of amyloid disease.

The United Kingdom shows an equal prevalence of Bright's disease, but it is mostly of the cirrhotic or gouty form, as might be predicted from the moist and fickle climate and the habits of the people. So, too, British America, whose latitude does not essentially vary from that of Great Britain and Scotland, presents about the same average prevalence of Bright's disease, but the type again changes to "parenchymatous" or

[1] Lectures on Albuminuria, p. 219.

[2] Bright's Disease and Kidney Affections, p. 145.

"tubal" nephritis, owing, doubtless, to the prevailing low temperature, deep snows, and consequent long periods of humidity.

It is an interesting illustration of this theory, that Newfoundland, with its excessive humidity, presents the highest percentage of the parenchymatous form of Bright's disease.

With the higher temperature of New Zealand renal disease becomes less frequent, and is least so upon the sub-tropical shores and islands of the Mediterranean and the solitary outposts of Mauritius and Bermuda, where a tropical or nearly tropical climate is tempered by a vast circumference of ocean. In the sub-tropical range, which is thus comparatively exempt from renal disease, lie the Cape and St. Helena, which are, on the whole, lightly affected, notwithstanding the prevalence of syphilis at these stations. The tables showing the actual proportion of death from "renal disease" in Great Britain, compiled by Dickinson, have little practical value, because "renal disease" is quite too flexible a term for scientific purposes. It is necessary that we should know exactly what form of "renal disease" is developed by a given climate or locality before any conclusions can be drawn which amount to anything from a scientific stand-point. The conclusions which the author deduces from his investigations, and which seem well founded, are the following:

1. Lardaceous or amyloid disease of the kidney is the type most prevalent in the tropical regions, partly as the result of the "disorders which the tropics entail upon Europeans," partly because of the excessive prevalence of syphilis and its miserable treatment by the native practitioners. (If the latter part of this theory be true, lardaceous disease ought to diminish as the knowledge of medicine increases among the Oriental natives and the treatment of syphilis comes to be more satisfactory.)

2. Other forms of Bright's disease, namely, *parenchymatous nephritis* and *interstitial nephritis* "belong especially to the temperate zone and to its colder districts." They lessen as we approach the equator, but they lessen still more as we proceed northward from the temperate zone until, as we reach the frigid regions of the north, renal diseases are almost unknown. It is a curious and instructive fact that Arctic explorers, from the days of Sir John Franklin, have been singularly exempt from renal diseases. My friend, Dr. Jacob F. Holt, of Philadelphia, who was surgeon to the first Peary expedition in search of the elusive north pole, informs me that not a case of renal or urinary disease appeared among the officers or crew of the vessel to which he was attached, a fact which he and others think is due to the increased demand upon the respiratory function for the purpose of maintaining body-heat. Exposure to extreme cold creates a vigorous demand for the fatty foods, to the exclusion or reduction of flesh diet, such as steaks, chops, and roasts. Hence the kidneys are relieved of the work of eliminating nitrogen; but the lungs become the theatre of fierce combustion, that the heat of the body may be maintained in the midst of Arctic snows and a temperature of 49° below the zero of Fahrenheit.

If we turn to the tropical regions again, we find also one explanation of the absence of renal diseases in the comparatively slight consumption of nitrogenous food. Fruits and cereals are the chief foods of the Oriental, his aim being not to increase body-heat, but to reduce it to the minimum. Hence the kidneys are not taxed with surplus work, and parenchymatous and interstitial forms of nephritis are so rare as to be curiosities.

In the temperate zones all this is changed. The more vigorous races of these regions, with their high-strung nervous systems and restless brains, which constantly impel them to attempt more than they can safely perform, demand a diet which is largely nitrogenous. It is the prevalence of meat-diet, especially its excessive consumption, in the temperate zones, in my judgment, which accounts for the frequency of Bright's disease quite as much as the climate. It is, indeed, true that the climate—which is a constant stimulant—renders nitrogenous diet necessary; but it does not render its excessive consumption necessary; and my own experience teaches me clearly enough that a restriction of meat-diet lessens the liability to inflammatory lesions of the kidneys.

Speaking from my own personal experience and observations in the field of renal pathology, and especially with reference to the parenchymatous and interstitial nephritis, I am convinced that the former is not infrequently a product of malarial poisoning. I have seen cases repeatedly which I felt constrained to attribute to repeated or habitual exposures to malarial effluvia, and which I could attribute to no other cause. Many of these cases gave distinct histories of repeated malarial outbreaks of a tertian or quartan type, and admitted repeated visits to localities reeking with paludal poison.

In one case I found the plasmodia of A. Laveran, together with a well-marked malarial "cachexia," decided albuminuria, hyaline and epithelial tube-casts, and edema of the feet. All these symptoms disappeared under the use of quinine (18 grains given every forenoon in three equal doses), and the patient remains well at this time, six months having elapsed. It is not impossible that many of the cases loosely attributed to "cold and wet" may really be due to malaria. A question of great interest is how tubal nephritis is produced by malaria. A very rational explanation is that it is due to the irritant effect of the plasmodia themselves upon the renal tubules or their epithelia. But this is conjectural, as I have never had the opportunity of examining a kidney in a case of malarial nephritis.

I have not been able to collect any trustworthy evidence as to the causation of interstitial nephritis by climatic changes, although I have sought diligently for such evidence. Plenty of cases have presented themselves in my consulting room and at my clinic, which might, upon superficial inquiry, have been attributed to peculiarities of climate or environment, but a more careful and searching investigation has revealed other causes, such as errors of diet, overwork, intemperance, etc., so that climate could not, with anything like scientific accuracy, be regarded as the efficient cause.

The curative effect of a uniformly warm climate which is free from paludal poisoning is unquestionable. I have seen the beneficial results of a residence in Algiers, the south of France, Northern Italy, Barbadoes, and the Indian Peninsula time and again. Our own Southern States are equally beneficial in localities where the moisture is not too great, but thousands of acres of virgin soil must be subdued by cultivation and thousands of other acres of cypress swamps must be drained before patients can be sent to *our* South without a careful discrimination as to time and locality. The south of Europe has been subjected to hundreds of years of close and severe cultivation, so that the sources of malarial poisoning are few and far between. Our "Sunny South" needs just that treatment to render it a salubrious and curative climate for Bright's disease, except in favored localities, which have already been passed through the early stages of civilization and cultivation.

REVIEW OF MEDICINE.

MEDICINE.

Incomplete Pyloric and Sub-Pyloric Stenosis. (*Bull. de l'Acad. de Méd.*, Vol. XXXVII., No. 20, 1897.) By G. Hayem, M.D., of Paris.

The author considers that it is impossible to distinguish between chronic continuous gastrosuccorrhea and an incomplete stenosis at the pylorus. The periodic form of gastrosuccorrhea he, with many others, believes is a form of gastric crisis due to spasm of the pylorus. The continuous form, however, is never due to peripheral or central nervous instability alone. The real cause is an incomplete stenosis, and of incomplete stenoses he recognizes two forms, and holds that these forms can be distinguished by the clinician. In the one form large quantities of stomach contents—200 c. c. or more—may be expressed in the morning, and in liquid expressed are large particles of food, while bile is absent or is found only irregularly and in small quantities. These patients suffer pain depending largely upon the nature and amounts of their food, and appearing after its ingestion. Vomiting is common. Dilatation is present, and may reach a high grade, and peristaltic waves are commonly seen. Such symptoms are dependent upon stenosis at the pylorus. In the other class the fasting stomach contains usually from 40 to 100 c. c. contents, rarely as much as 200 c. c.; bile is an almost constant ingredient, and the particles of food are too small to be recognized as such except by the microscope. Pain is more habitual with these cases, persisting during the course of digestion and not dependent to a marked degree upon the ingestion of food or upon its nature or amount. Vomiting is infrequent, and depends upon pyloric

spasm after dietetic errors. Dilatation does not become pronounced, and is often lacking, and peristaltic waves are not seen. This variety of cases of succorrhea he was long inclined to attribute to simple nervous influence, but he now believes that the cause is incomplete stenosis below the pylorus. This view he bases upon the difficulty of conceiving of a permanent spasmodic pyloric stenosis, upon the entire absence of any knowledge of the existence of such a condition or of nervous irritation from other functional cause which would give rise to continuous secretion, and upon the positive evidence of autopsies upon two cases which had presented symptoms like those seen in the last class of cases. At one autopsy the upper half of the duodenum was found dilated, due to a constriction at the junction with the jejunum. The second case showed old false membranes in the duodenum, and during the gastro-enterostomy, following which the patient had succumbed, the surgeon divided an adhesion between the ascending colon and the duodenum. Hayem believes there had been a periduodenitis causing retention in the stomach. While he admits the possibility of Reichmann's disease arising from functional pyloric spasm, he strongly doubts such an occurrence, and insists that any organic stenosis of the pylorus or duodenum must be first excluded, and that in cases presenting such symptoms the only curative treatment at present available is operation. In the discussion following, Robin asserted his belief in spasmodic stenosis of the pylorus. The discovery of a large deficit in the excretion of nitrogen and mineral salts is, he asserts, distinctive of organic stenosis, and excludes gastric ectasy without stenosis or with intermittent spasmodic stricture. He bases his belief in a permanent spasmodic stenosis at the pylorus upon the following points: 1. Eructation of acid stomach contents causes spasm of the pharyngeal and masseter muscles. 2. When hyperchlorhydria is intermittent distention of the stomach is exceptional and ceases with the crisis. When it is permanent the organ is constantly enlarged, but of variable size. 3. Most patients who have symptoms of pyloric spasm have more or less pain over the pylorus, which is increased on pressure. 4. Experimentally superficial irritation of the gastric mucosa causes immediate pyloric spasm. 5. M. Doyen informed him that in 100 operations upon the stomach he had found 61 cases of stenosis, in 46 of which there was simple spasmodic stricture with dilatation; 24 of the latter were due to simple excessive sensitiveness, 22 to ulcer situated at some distance from the sphincter. Upon these grounds he objects to a routine advice of surgical treatment, and gives notes of cases of continuous secretion disease cured by medical measures.

EDSALL.

On Hematoporphyrinuria. (*Deutsch. Archiv f. klin. Med.*, Vol. LVIII., Nos. 2 and 3.) By Dr. Nakarai, of Japan.

Hematoporphyrinuria has until recently excited interest only in its connection with sulphonal poisoning and its less frequent occurrence after

prolonged use of trional. Friedländer collected more than one hundred cases of sulphonal poisoning, but N. has been able to find clear evidences of hematoporphyrinuria in but twenty-three cases of intoxication from this drug and in nine following the use of trional. Garrod has, however, found it an almost constant ingredient of pathological urine and, in small quantity, even of normal urine. Stokvis, in particular, believes that it is nearly always present in the urine of patients the subjects of lead-poisoning. It has been found by others in disease and in health, and the author has made a series of 250 examinations of the urine from 144 diseased persons, making spectroscopic examinations after Salkowski's method. He found hematoporphyrin in but ten of the 144 cases—*i. e.*, in all the six cases of lead-poisoning that he examined, in two cases of intestinal tuberculosis, in one case of rheumatism, and in one case of empyema that had used sulphonal for a considerable period. The cases of lead-poisoning showed its presence each time they were examined, even though at least one case was seemingly entirely cured when discharged. In some cases the quantity, however, decreased greatly with the general improvement of the patients. In the two cases of tuberculosis he got positive results only after severe intestinal hemorrhage. The case of rheumatism was complicated by pericarditis, and in the other case sulphonal was probably the exciting agent. The specific gravity of the urines which contained the substance varied from 1012 to 1020, the color varied from deep red to that of clear water, and the gross appearance was no test of its presence or absence. Death has followed in nine of the twenty-three cases of sulphonal poisoning in which it has been found. Most of these patients were women. They were, however, in most instances already gravely exhausted, and it is impossible to state to what extent the loss in hemoglobin which the hematoporphyrin denotes was responsible for the fatal issue. N. has not found that it has prognostic importance in any of the diseases in which he found it. In lead-colic the quantity was usually, but not always, greater after the attack and decreased in convalescence, but persisted until discharge. He disagrees with Stokvis as to the cause. The latter author believes that hemorrhages in the walls of the digestive organs cause it, but a rabbit which died after N. had fed it five grammes of sulphonal in ten days showed no such lesions, nor did one that succumbed after taking three grammes of lead acetate in fourteen days. The urine of the latter rabbit showed traces of hematoporphyrin; the blood was dirty red in color, but the spectroscope showed no hematoporphyrin. Such hemorrhages are, therefore, not the sole cause, though Stokvis' work and N.'s own cases after intestinal hemorrhage in tuberculosis demonstrate that it may follow these hemorrhages. The urine of lions and tigers examined by N. contained no hematoporphyrin, although they were fed upon raw meat and many blood elements were found in the stools. This throws much doubt upon Stokvis' theory that physiological hematoporphyrinuria arises from the hemoglobin in the food.

EDSALL.

Gastroptosis. (*Berl. klin. Woch.*, May 17, 24, and 31, 1897.) By Leop. Kuttner, M.D., of Berlin, and Dr. Dyer, of Portland, Maine.

As to the etiology of downward displacements of the stomach, the authors consider the malposition acquired, since it is but very rarely met with as a congenital condition. The displacement must, too, take place in late childhood or adult life, since not one of the many children and infants examined in the Augusta hospital showed it. They admit the frequency of tight-lacing, of numerous pregnancies, and particularly of improper management of the puerperium, but, with Kelling, insist that these act less distinctly by their actual pressure at loosening of the support of the stomach than through the disturbance of the motor function of the stomach itself, the latter producing atony with retention of contents, which leads to downward displacement by traction upon the attachments above. They are also emphatic in stating that these active causes have their effect only in those predisposed by neurasthenic constitution, more especially in those with digestive neurasthenia. The abnormalities of the sexual organs, the atony of the intestines, the wandering liver and kidneys, and the enteroptosis so frequently found with the condition are not the causes of gastroptosis, but the coincident effects of the overstretching of the abdominal muscles or the peritoneal ligaments, the diastasis of the recti, and the like, which give origin to all these. Of 300 unselected cases examined in series 46 showed gastroptosis, and of these 42 were women and girls and 4 were males. Of 39 women 29 had borne children and 17 were multiparæ. Most of the cases were between the ages of 15 and 45, the period when pregnancy and tight-lacing have active opportunity for causation. The occupation had little apparent influence; none of the patients had undertaken especially heavy labor. The seeming frequency of the condition together with chlorosis they consider due to the general atonic constitution of the chlorotic, and particularly to the gastric atony which they find frequent in chlorosis, thus accepting a view directly contrary to that of Meinert, who makes gastroptosis the common cause of the chlorosis. The authors estimated the hemoglobin in a series of cases of gastroptosis, and found the average percentage was not lower than in persons whose stomachs were in normal position. Symptoms are frequently absent. Of their 46 cases, 20 had no symptoms, and the condition was discovered only by routine examination; 10 had dyspeptic symptoms entirely referable to other gastric disease; while in 16 there were gastric symptoms which seemed altogether due to the displacement, but these are not at all characteristic, and consist of subnormal or excessive appetite, pyrosis, pain in and distention of the epigastrium, largely dependent upon the quantity of food taken, constipation, and other common dyspeptic complaints. The functions are disturbed, the motor functions being almost constantly below the norm, and this may often be found as the actual cause of the displacement. The secretions are often normal, but frequently show changes. Subacidity is frequent as the local expression of a general atony, and, on the other hand, retained ingesta

may irritate the stomach into the production of a hyperchlorhydria. General nervous symptoms, expressive of the neurasthenic habitus of these patients, are practically constant. That the displacement, as Bial asserts, gives rise to unimportant clinical symptoms in men, perhaps to none at all, they do not admit, but believe that Bial's view arose from observation of cases in men in which it *chanced* that no symptoms appeared. This may occur in either sex and with other similar conditions. The authors do, nevertheless, consider an existing gastroptosis more important in women than in men, as causes are more numerous and more effective in females. They make the diagnosis of the displacement after the usual manner, insisting strongly upon the value of ordinary percussion, though holding that inflation through a tube is much more satisfactory. Slight and early grades are not recognized by these means, and, as the most useful method for demonstrating such varieties, they recommend the use of the gastrodiaphane, which they, unlike most authors, find a very satisfactory instrument. The important complications of gastroptosis are gastritis, gastric ulcer, and gastrectasia, the former resulting from the constant irritation of retained food, ulcer being caused by local pressure or traction or overdistention, while both retention of food and the angulation of the duodenum are productive of dilatation. Prophylaxis is as important as treatment of the existing displacement. Constriction of the waist by corsets or tight clothing should be prevented when possible, and puerperal women should lie solely upon their backs for six days after childbirth, when they may be allowed to lie upon their sides, and only after two more days have passed may they leave the bed even to empty the bladder or rectum. Lax abdominal walls necessitate a binder, regulation of the bowels, cold douches, massage, and electricity. The treatment of the condition itself includes all the last-named measures, a well-fitting binder and regular defecation being especially necessary. Displacements of any other abdominal organs should be corrected as far as possible, by operation if necessary. Medicinal treatment consists in giving strychnine or nux vomica to improve the tone of the stomach muscle, and in treating any special symptoms which may arise.

EDSALL.

Intermittent Albuminuria. (*Lyon médical*, 1897, No. 25.)

Lacour reports three cases of intermittent albuminuria which occurred in the same family. As often as six times, based upon as many observations, attention has been called to the family character of this disease. In the family of the children treated by Lacour, gout is hereditary, which fact he considers very important in regard to the etiology.

ROOS.

Transmission of Typhoid Fever Germs through the Air. (*Zeitschrift f. Hygiene*, Vol. XXIV., No. 3.)

According to the investigations of Germano under Finkler's direction, the germ of typhoid fever cannot resist complete exsiccation; therefore, it

cannot be transferred to man by means of dry dust, but the bacillus retains its virulence in a semi-dry medium, such as laundered clothes, wearing apparel, wood, and dirt mixed with fecal matter, etc. In all probability, most infections occur through contact with objects of this kind.

Roos.

Pyogenic Infection through the Pharyngeal Mucous Membrane. (*Archiv f. klin. Chir.*, Vol. LIV., No. 4.)

Lexer made abundant and minute investigations to find out to what extent pyogenic infections may occur through the mucous membrane of the pharynx. Streptococci transferred in minimal quantity into the uninjured oral cavity of a rabbit produce a general infection. In about half an hour the streptococci can be demonstrated in the internal organs, and later on in the blood (in abundance). The pharyngeal lymphatics have been found to be the openings of entrance for the germs. Staphylococci have no deleterious influence: they are destroyed in the rabbit's mouth. Nor can infection be produced with pneumococci. It seems that the saliva has some mitigatory effect upon the virulence of many of the pathogenic micro-organisms and appears in certain cases even to render them harmless.

Roos.

THERAPEUTICS.

Remarks on the Plague Prophylactic Fluid. (*British Medical Journal*, June 12, 1897.) By W. M. Haffkine, D.Sc.

The following are the features by which the plague bacillus may be recognized. Broth richly inoculated with the plague bacillus is to be placed in a perfectly quiet position on an absolutely solid table or shelf and observed undisturbed. The least oscillation will destroy the reaction. From twenty-four to forty-eight hours after inoculation, the liquid remaining limpid, flakes appear underneath the surface, forming little islands of growth. In the next twenty-four to forty-eight hours the flakes grow down in a long stalactite-like jungle, the liquid always remaining clear. In from four to six days the islands of growth get more compact and solidified. If the flask is then slightly disturbed, the islands fall down to the bottom in a sort of snowfall, bringing down the stalactites, the whole growth being deposited at the bottom. The islands, when solidified, are not disintegrated even by violent shaking, whereas the stalactites are very fragile. The appearance of the islands of growth underneath the surface is accompanied or preceded by the deposition of a residue on the sloped walls of the flask and at the bottom, as well as by the appearance of a ring around the surface of the liquid. When inoculated into partially dried agar-agar which does not contain glycerin, involution forms of the plague bacillus develop. These forms have been found in the tissues of inoculated rabbits and in the human tissues. In the preparation of the plague pro-

phylactic fluid, a luxurious crop of plague organisms is cultivated by adding to the nutritive media abundant quantities of fat exposed to free aëration. The fat used is clarified butter, which is suspended on the surface of the nutritious fluids. When the fluid is filled with a rich jungle of stalactites, the growth is shaken off from the drops of butter and brought down to the bottom of the liquid, leaving the butter on the surface free to produce a second crop of growth. In the course of a month, half a dozen successive crops are thus obtained, which fill the liquid, when shaken, with an opaque milky emulsion. The micro-organisms in this fluid are killed by exposing them for one hour to a temperature of 70° C. In a quiet position in test-tubes two different substances are then obtained: a thick white sediment and a perfectly limpid fluid. Injected subcutaneously into animals they produce—(1) the sediment, a local inflammation, and a nodule at the seat of inoculation, accompanied by little fever or general effect; and (2) the fluid, a considerable rise of temperature, and a general affection with no noticeable local effects. On January 23, 1897, the plague broke out in the House of Correction, Byculla, Bombay. In seven days fifteen cases developed, of which eight proved fatal. On the afternoon of January 30, 1897, 154 prisoners, belonging to the same batches as the rest and living with them in perfectly identical conditions, volunteered to undergo the preventive inoculation. Each of these prisoners received 3 c. c. of the mixture of sediment and fluid described above. One of these men had swollen glands at the time of inoculation and two others showed enlarged glands on the same evening. These three cases also proved fatal. From the next morning a difference showed itself in the susceptibility and mortality of the inoculated when compared with the non-inoculated individuals. Among non-inoculated individuals twelve cases developed, of which six were fatal. Among the inoculated two cases only developed, both of which recovered. If these results are further confirmed, the plague prophylactic will appear to influence the disease even when in a very advanced stage of incubation. The period of incubation in plague is from two to seven days, whereas the prophylactic fluid will act in from twelve to fourteen hours. Between January 10 and May 6, 1897, 11,362 individuals from the infected areas have been inoculated, with only twelve fatalities. Of these twelve, three were ill at the time of inoculation, three contracted the disease within twelve hours after the inoculation, two fell ill within three days after the inoculation, and four were attacked from fifteen to twenty-five days after the inoculation. There were thirty-three attacks among this number of inoculated individuals attended by recovery.

SWAN.

Etiological Experimental Therapy. (*German Congress for Internal Medicine*, Berlin, 1897.) By Dr. Behring, of Marburg.

The "experimental therapy" finds itself in strict opposition to the medical treatment. Hitherto medicine has had therapeutic principles with-

out the experiments, because it studied only the effects of remedies applied to the healthy animal or healthy man. For this reason, Hahnemann was not entirely wrong in taking the symptoms of the sick man as starting point for his calculations. Also in the principle *similia similibus* the modern etiologic therapy meets homeopathy, which only by the sort and manner of its practical applications has been debased to quackery and charlatanry. The principle of "allopathy," *contraria contrariis*, is not better proved. In it one combats the most conspicuous manifestation of the disease with drugs. The cellular pathology has proved unproductive for therapy, and the organ therapy could not gain a strong foot-hold. The etiologic therapy is based upon experiments upon the sick animal. In diphtheria, for the first time, it has been demonstrated that the only effective remedy is produced by the body itself, which renders itself immune towards the virus of the disease. The system furnishes a preventive and curative substance from live and dead infectious material. The preventive remedies prepared from an organism intentionally infected by a special virulent microbe prove to be effective against the same infection in another organism. The curative power of nature consists, first, in phagocytosis; secondly, in elimination of infectious matter through the feces, urine, and sweat; thirdly, in the protective wall of epidermis and epithelium. Independent of the living organism the antitoxins of one animal act as healing factors for the other. The antitoxic energy accumulated in the organism of a highly immunized animal is concentrated in the blood-serum. Of all the antitoxins hitherto known, the diphtheritic serum develops the most certain efficacy. We would have better success with the tetanus serum if we could have it in the hospitals, always ready for immediate use. The value of the Marmorek streptococcic serum is doubtful. The tuberculosis serum of Maragliano does not contain any antitoxin. The blood antitoxins are absolutely harmless for healthy and sick men. It is only a question of technique to remove the causes of some accessory complication (urticaria). The supposition that the antitoxin exercises its effect not upon the toxin but upon the living cell cannot be held. Ehrlich's experiments with ricin have proved that antitoxin neutralizes the toxin also outside of the living organism. All attempts to analyze the antitoxin as a chemical body were fruitless, and they are hopeless principally because we do not deal with a chemical body but with a force which cannot be isolated. Just as the iron is the bearer of magnetic force, so are the albuminoids in the blood the bearers of the antitoxic energy. With the increase of immunization of the organism the blood-serum becomes charged with this force to a certain point, but never above that. The efforts to obtain antitoxin from toxin by means of electrolysis proved to be a hopeless undertaking. These experiments will never succeed outside of the organism. Antitoxin almost polarizes the blood-serum, but never forms a chemical compound with it. The passive immunization with antitoxins is preferable to the active immunization with direct toxin. At the present time investigations are

carried on to prolong the durability of the preventive power of the antitoxins. Wherever the virus of a disease is not known, as, for instance, in septicemia, there is no use to search for antitoxins, and for cholera, glanders, and anthrax the virus is too weak yet. In time the tuberculosis antitoxin can be successfully applied. Bacteriology gives us some excellent remedies, which will warrant for the "experimental etiologic therapy" a well-established and undisputed place in our therapeutic treasury.

Roos.

The Treatment of Cystitis and Ammoniacal Urine with Urotropine. (*Der ärztliche Practiker*, 1897, No. 12.) By Prof. A. Nicolaier, M.D.

About two years ago Nicolaier introduced into therapeutics hexamethylenetetramine, a compound of formic aldehyde with ammonia, under the name of urotropine. After its use in sufficiently large doses the urine acquires greater solvent power upon uric acid, and also exerts an antiseptic action upon micro-organisms in cystitis accompanied with ammoniacal fermentation of the urine. Urotropine is strongly recommended to the notice of the medical profession. This substance is a weak base, and consists of white crystals easily soluble in water, less so in alcohol. The aqueous solution of urotropine has a pleasant, sweetish taste, and gives with bromine water an orange-yellow precipitate, which reaction enables it to be detected in the urine. It passes into the urine undecomposed, and by the above test the drug is discovered in the urine a quarter of an hour after administration of even a small dose. After a single dose of 8 grains the bromine reaction of the urine lasts 13 hours, and after a dose of 15 grains 27 hours. As regards the administration of urotropine, a dose of 22 grains *pro die* is recommended. Experience shows that larger single doses are well tolerated, but on continued administration unpleasant symptoms manifest themselves in some patients, such as a burning sensation in the region of the bladder, and sometimes abnormal desire to urinate. If the administration of large doses of urotropine is persisted in despite these symptoms, red blood-corpuscles appear in the urinary sediment, but upon reduction of the dose all these symptoms soon disappear. Urotropine is not at all dear, and its employment is facilitated by its exhibition in the form of $7\frac{1}{2}$ grain pastilles, which are put up in boxes containing 20 each. It is advisable to prescribe a $7\frac{1}{2}$ grain pastille in half a pint of water, or aërated water, morning, afternoon, and evening during the first two days, for cystitis with ammoniacal fermentation of the urine. By the second day the action of urotropine is generally developed, and the daily dose may then be reduced to 15 grains (one pastille morning and evening). Subsequently, the dose may in many cases be reduced still further to $7\frac{1}{2}$ grains *pro die*. In daily doses of 15 grains urotropine is tolerated for long periods; several patients have taken it in uric acid diathesis for two years uninterruptedly, and one patient took 22 grains daily for nine months without the slightest incon-

venience. Personally, the author has never observed any disturbance of the alimentary system from employment of urotropine. Under the influence of the urotropine the cystitis undergoes considerable modification in a short time. The ammoniacal odor of the urination abates and completely disappears, whilst the reaction of the urine, even after standing the whole day, remains acid. The urine also becomes clear, no crystals of triple phosphate or urate of ammonium are deposited, and the troubles arising from the abnormal character of the urine cease. The pus-corpuscles in the urine also diminish, and may wholly disappear, but generally a small quantity appears for some time.—*The Therapist*, July 15, 1897.

CATTELL.

SURGERY.

Sterility from Bilateral Epididymitis. (*Deutsche militärärztliche Zeitschr.*, 1897, No. 4.)

Benzler made careful and reliable inquiries from thirty-one men, who were at a previous time—during their military service—afflicted with epididymitis bilateralis, and who later on entered into matrimonial life. Of these 38.7 % proved to be sterile, 61.3 % produced posterity—some of them quite a numerous one. In the latter series of men the epididymitis was only in three instances associated with vasitis, while in the cases which led to sterility this complication existed in 50 % of the cases. The prognosis in cases of bilateral epididymitis regarding the potentia generandi is, therefore, according to the author's investigation, much more favorable than it is commonly believed to be.

ROOS.

The Progress of Laryngology and Rhinology. (*Brit. Med. Jour.*, June 19, 1897.) By St. Clair Thomson, M.D., of London.

The present century had more than half run its course before laryngoscopy became a practical art. For the invention of the laryngoscope we are indebted to Signor Manuel Garcia, a distinguished Spanish singing master, long resident in London, and, happily, still living, a hale and hearty nonagenarian. His discovery was made in 1854, and in the following year he presented a paper to the Royal Society of London entitled "Physiological Observations on the Human Voice." His investigations were all carried out on himself, and in his autoscopic examination he employed two mirrors—a small one at the end of a long stem for introducing into the pharynx, and a large one, which served both for directing the light on to the smaller mirror, and for enabling the operator to see the image formed on it. This method had been independently imagined by Garcia, but it will at once be recognized that it is precisely similar to the one employed by Babington twenty-two years previously; the latter, however, never

examined his own larynx, while Garcia's observations were made on himself. So far as England was concerned, Garcia's discovery shared the same fate as Babington's; it was treated with apathy, and even with incredulity. His paper, however, fell into the hands of Dr. Türck, of Vienna, who, after some experiments, appears to have thrown the mirrors aside as useless, and to have formed the conclusion that "he was far from entertaining too sanguine hopes about the employment of the laryngeal mirror in practice." In the same year the mirrors were borrowed by Dr. Czermak, of Budapesth, and he was quick to see what was wanting to complete an invention which he recognized at once as being of the greatest promise. Czermak substituted artificial light for the uncertain rays of the sun; the light was reflected and concentrated by a large ophthalmoscopic mirror; laryngeal mirrors were constructed of different sizes; and, finally, the art of laryngoscopy was perfected, and presented to the world in an article in the *Wiener medizinische Wochenschrift* on March 27, 1858. The difficulty of deciding the priority of this invention induced the French Academy of Science, in 1860, to divide the Prix Monthyon between the two candidates, Türck and Czermak. It is sufficient to recognize that the possibility of viewing the interior of the larynx was certainly demonstrated by Babington in 1829, but he failed to conceive the future of his invention. The successful attempt to view the vocal cords was independently carried out by Garcia in 1854. An effort to apply the discovery to medical use was made by Türck in 1857; but the perfecting of the technique, and the realization of its possibilities, must be attributed to Czermak. Indeed, in one of his earliest communications on the subject, he insisted on the fact that the invention was not only of the greatest service in diagnosis, but also in treatment. He was the first to demonstrate its use in posterior rhinoscopy, and in 1863 he detected, with the mirror, in the post-nasal space the "growths like a cock's comb," which, five years later, were fully discovered by Meyer, of Copenhagen, and described as adenoid vegetations.

General Emphysema Followed by Recovery. (*Brooklyn Med. Journal*, October, 1897.) By Charles G. Molin, M.D.

Half an hour after being run over by a wagon, a robust eight-year-old boy was found to be suffering from emphysema, extending over the whole body except the palms and soles. Penis and scrotum were so puffed up as to resemble oblong rubber balls, and an attempt to hold the eyelids open with adhesive straps proved unavailing because of the tense state of the skin. The tissues under the scalp were also involved, crackling being distinctly perceived. The skin of the whole body was tense and pale. There were slight contusions on the elbow and chest. Respiration was labored. Palpation disclosed fractures of the sternum and second right rib. Three hours later the emphysema had so increased as materially to interfere with respiration; skin stretched almost to the limit of its elasticity; increasing cyanosis. On incising the chest the effect was instantaneous, as if a

tense rubber ball had been pricked, and breathing immediately became deeper and slower. Two rubber drainage-tubes were inserted and left in for five days. Next day a pneumonia jacket was applied, after which the treatment was expectant and symptomatic, the only complication being a mild localized pleurisy and hemoptysis. The pneumothorax had practically disappeared on the sixth day, by expulsion rather than by absorption. The air in the tissues was absorbed so slowly that it could still be detected therein eighteen days afterwards.

CATTELL.

The Mechanical Conditions Governing the Absorption of Iodoform. A Contribution to the Toxicology of Iodoform. (*Beiträge zur klin. Chirurgie*, Vol. XVIII., 1897.) By W. Huebner, M.D.

The incentive to this article on the somewhat trite subject of iodoform-poisoning was given by the occurrence of several deaths, supposedly from this cause, in Professor Mikulicz's clinic in the summer of 1895. A very finely powdered iodoform had been used, which renders it highly probable that it was more quickly dissolved and absorbed, and also that undissolved particles were carried away by the lymph-current. Although most authors advise the use of the larger crystals on theoretical grounds, the kind of iodoform used in cases of iodoform intoxication is generally not given. A long series of experiments were made to determine the comparative toxicity of large and medium crystals and of very finely precipitated powder and of iodoform gauze. The drug, enclosed in gelatine capsules and later on in powder, was introduced into the peritoneal cavity of guinea-pigs and rabbits. In order to imitate as much as possible the conditions prevailing in a surgical wound, a part of the peritoneum was excised, thus opening numerous blood-vessels and lymph-channels. The results did not show any material difference in the toxicity of the different specimens of the drug. The author calls special attention to the extensive adhesions caused by the presence of the drug either in the form of powder or of gauze. Such adhesions had frequently been observed by a number of surgeons. Rovsing very properly ascribes to it a decided chemotactic and irritating action. The author, therefore, warns against its indiscriminate use in the peritoneal cavity. Only where infection exists or where control of hemorrhage is desired should it be used. In the second series of experiments the ears of rabbits were scarified, the different specimens were rubbed in, and after varying intervals the ears were ligated and amputated, hardened in boiling water, and examined microscopically. The large crystals were found in the neighborhood of the wound, while the particles of fine powder had been carried away undissolved by the lymph-current. The crystals were found to have changed in color, varying from a golden yellow to a deep black, and before being absorbed became disintegrated into small vesicular granules. Before final absorption iodoform is decomposed into complicated iodic bodies.

MUEHLECK.

The Gonorrheal Inflammations of the Joints, Bursæ, and Tendon Sheaths. (*Volkmann's klin. Vorträge*, 1897, No. 181.) By Dietrich Nasse.

During one year thirty cases of gonorrheal inflammation were observed in Bergmann's clinic, in nineteen of which Dr. Rindfleisch, who made the bacteriological examinations, found the coccus of Neisser present. N. believes, however, that even where the presence of the gonococcus cannot be demonstrated many cases can be recognized as belonging to this class of affections. They may appear at any time after infection, but the occurrence of these attacks depends principally upon the time when the cocci invade the mucous membrane and deeper structures, the interval varying with different subjects. The author believes that the affection is more frequent in older cases. Gonorrheal inflammations of the synoviæ can occur in consequence of infection in any part of the body, such as gonorrheal inflammations of the conjunctiva, stomatitis, vulvo-vaginitis of the new-born and of older children. Joints which are most exposed to traumata seemed especially predisposed. In males the knee is most frequently attacked, in females the wrist. The danger of ankylosis even after mild attacks is very great, and in addition there is a decided tendency to spontaneous dislocations, due to secondary contractions of the inflamed synovia and periarticular tissue. Effusion is usually not copious, mostly sero-fibrinous in character, containing a few leucocytes. More rarely the trouble begins with violent pyemic symptoms and purulent effusion which may perforate the capsule. In such cases the cartilaginous surfaces of the bones are rapidly destroyed and death may ensue. Tendo-vaginitis may occur, isolated or in conjunction with joint affections ; they are most frequently observed in the hands and feet. When tendo-vaginitis is present alone, the prognosis is much better then when the joints are also affected. When both are combined, gonorrheal infection should always be suspected. Inflammations of the bursæ are more rare. They are most frequent in the neighborhood of the calcaneum and are associated with considerable cicatricial induration. The affection is extremely obstinate and painful. Microscopically, the peculiar tissue-proliferations in and around the joint are the most peculiar features ; in this all authors agree. Clinically it is important to note that relapses are very frequent as long as the primary infection exists or a new one has been contracted. The most important indications for treatment are compression, rest, and immobilization of the parts, followed by massage, warm baths, and Priessnitz bandages. When considerable effusion with periarticular swelling exists, puncture may be indicated together with intra-articular injections of iodoform. In severe cases opening and drainage are indicated. The author, however, warns against too continued immobilization, owing to the danger of ankylosis. The local treatment of the primary disease in such cases should consist in mild astringent injections. In no case should heroic remedies be used, on account of the danger of fresh metastases. MUEHLECK.

On Multiple Stenoses of the Gut of Tuberculous Origin. (*Beiträge zur klin. Chirurgie*, 1897, Vol. XVII., No. 3.) By Fr. Hofmeister, M.D.

The author cites an interesting case of this rare affection, which, together with the hypertrophic form, has been so classically described by Czerny and Koenig, to whose labors surgery is also largely indebted for its treatment. Two distinct forms of the disease must be differentiated. The first form attacks the ileo-cecal region, much more rarely the transverse colon or the small gut. This form is associated with inflammatory proliferation of tissue, with tumefaction, and quickly causes obstruction of the gut. The second and much rarer form is characterized by one or more constrictions of the intestinal lumen, due to cicatricial contractions of more or less completely healed circular ulcers. The rarity of this form of intestinal stenosis is undoubtedly due to the slight tendency of the ulcers to heal. The strictures are usually found in the ileum, and the number of constrictions reported by different authors varies from two to twelve. Both forms may occur together. The distance between the individual constrictions is extremely variable, and from a surgical stand-point is of the utmost importance. Koenig has described the peculiar behavior of the bowel in this condition, the part above the stricture being hypertrophied and distended, while that below is regularly found atrophied. When multiple stenosis exists the gut is hypertrophied and dilated as far as the first mechanically effective stricture, the lesser constrictions above giving the gut an ampullar appearance. For the symptomatology and diagnosis the author refers the reader to the exhaustive monographs of Czerny and Koenig, but observes that in no single case has the number of constrictions been ascertained or even suspected before operation. The treatment in case of a single stricture is simple, and resolves itself into resection of the gut. Out of a total of fifty operations, thirty-four, or 68 %, were successful. Should this operation be impossible, the surgeon can resort to entero-anastomosis. Simple enterostomosis is not to be recommended. In case of multiple stenoses the conditions may vary greatly. When they are confined to a comparatively short piece of the gut, they should be treated as one, and the affected segment resected. If two strictures are separated from each other by a long segment of healthy intestine, they should be resected separately. Unfortunately, this is not always possible, owing to the generally reduced condition of these patients and their inability to tolerate such prolonged operations. A further contraindication to multiple resections is the presence of tuberculous ulcers between the strictures. The greatest difficulty is found in those cases where the number and extent of constrictions place the possibility of individual resections out of the question, and where at the same time resection of the entire affected portion seems dangerous. In these cases the author recommends entero-anastomosis. Where strictures are found widely distributed over the entire gut, the operation will simply be an exploratory one, or may consist in the attempt

at dilatation of the narrowest ones (Pyloroplastik of Heinecke-Mikulicz). When, as in the author's case, the operation is undertaken during an attack of ileus, the prognosis is most grave. Here the obstruction must quickly be removed. If it is found necessary to puncture the distended gut, this portion should be sewed to the abdominal wall and drained to the surface. Simple suture is not to be recommended, owing to the danger of redistention, rupture of the suture, and fatal peritonitis. The incision should be sufficiently long to enable the operator to examine the entire intestine. The paper includes an exhaustive table of the literature of the subject.

MUEHLECK.

Aseptic Surgical Operations performed with Cotton Gloves and with Mouth-Protector. (*Centralblatt f. Chirurgie*, July 3, 1897.) By J. Mikulicz, of Breslau.

In spite of the employment of asepsis in operations, wounds do not always remain aseptic, but at times are attacked with an infection that may prove fatal. Mikulicz believes catgut to be comparatively harmless and not often responsible for this acquired infection. Twenty years' experimentation has resulted in the establishment of reliable methods for catgut sterilization. It is the hands of the operator and his assistants that prevent the operation from being completely aseptic. To avoid this difficulty the author introduced into his clinic the wearing of cotton gloves. These are subjected to steam sterilization in the same manner as the dressings. The advantages claimed for these gloves are that they are easily sterilized and that their cost is insignificant. The results are extremely satisfactory. During the three months they have been in use, there has not been at the Mikulicz clinic a single case of infection in wounds which were entirely closed, with the view of obtaining healing by first intention, or in wounds which were not drained. Abscesses were never met with. Before putting on the gloves Mikulicz disinfects his hands as heretofore. If the operation be very bloody he changes the gloves once or twice. In gastrotomies or enterotomies a new pair of gloves is put on when the bowel is opened and another when it is closed. The objection naturally proposed, that one would be unable to feel or grasp the tissues or apply the sutures, is not well founded. In a few days one becomes thoroughly accustomed to the gloves, and their use neither handicaps the operator nor prolongs the operation. The author claims no originality for the idea of employing gloves, referring to H. Robb's recommendation of rubber gloves in 1895. The latter have no special indication except to protect the hands in septic operations. Mikulicz considers the pathogenic bacteria in the oral and nasal cavities another source of infection, to avoid which he has introduced into his clinic the so-called "Mundbinde," which are so constructed as to cover the mouth, nose, and if necessary the beard. These, previously sterilized, are worn by himself and his assistants.

FRAZIER.

The Surgical Treatment of Chronic Ulcers of the Stomach. (*Centralblatt f. Chirurgie*, July 17, 1897.) By J. Mikulicz.

The author emphasizes the importance of the surgeon consulting with his medical colleague in this class of cases. As a rule, these patients do not come under the surgeon's care till after a number of weeks have elapsed. The completion of operation does not complete the treatment of these cases, when careful post-operative treatment and rigid attention to diet are necessary to prevent the operation from terminating fatally. Cohn, of Strasburg, and Doyen were the first who performed gastro-enterostomy in patients afflicted with gastric ulcer, with a successful termination. In cases where there are no complications and there is no immediate danger to life, the question "When should we resort to surgical interference?" must be answered from two points of view: first, as to the danger to life, and, secondly, as to its usefulness. As to the first point, one should know what danger to life is involved in a gastric ulcer *per se*. Statistics show that in autopsies cicatrices are seen two or three times as often as fresh ulcers, and from this it is safe to assume that at least seventy-five per cent. of all gastric ulcers heal spontaneously. But it should be remembered that the resulting cicatrices may eventually lead to stenosis of the pylorus or be the nidus for the formation of a carcinoma. Statistics collaborated individually by Gerhardt, Welch, Müller, and others differ widely from one another, the favorable statistics placing the mortality at fifteen per cent. and the unfavorable placing it at fifty per cent. Taking the mean between the highest and the lowest and reckoning on all possible complications, Mikulicz places the mortality at twenty-five or thirty per cent. Such being the mortality in unoperated cases, to estimate accurately the inherent danger of gastric ulcer one must also consider the mortality of the operative cases, as the operation is itself in some cases less dangerous than the ulcer. The author has collected 238 operative cases, which include 36 that came under his own observation. Out of the total of 238 cases have been selected those from the clinics of Billroth, Czerny, and the author (and these constitute one-third of the total), all of whom hold the same views on which the indications for the various operations, resection, pyloroplasty, and gastro-enterostomy, are based. The statistics of the period to the end of 1890 show a mortality of 48.1 per cent. (Mikulicz's individual mortality was 20 per cent.); from 1891 to October, 1896, a mortality of 18.3 per cent.; and from October, 1896, to March, 1897, no mortality, 10 cases being operated on with 10 recoveries. The collected mortality of the three periods is given as 26.7 per cent. Of the three operations pyloroplasty has by far the lowest mortality, but this fact should not discriminate against the other operations, for each has its special indications, and the success attained in this field is attributed to the care employed in the selection of the appropriate operation. Mikulicz sums up the situation by saying, "The danger to life in which a patient with a gastric ulcer finds himself is, to say the least, no

less, and probably is greater, than the danger which the patient incurs in submitting to an appropriate and properly executed operation." Experience has taught him that after removal of the pyloric stenosis the motor and secretory disturbances of the stomach disappear and the organ regains its normal functional activity. Of the cases uncomplicated with stenosis, equally favorable results have followed the operations of Koster, Hofmeister, Klausner, and others. The author then refers to a series of four cases in which he performed pyloroplasty with marked success. In the first two cases, respectively of seven and nine years' standing, the ulcer was excised; in the other two the ulcer was not disturbed, nothing but a pyloroplasty being done. Attention is called to the fact that in all four cases all the symptoms disappeared, but not simultaneously; in the first two pain gradually disappeared; in the last two the relief was immediate. *Pari passu* with the abatement of the other symptoms it is interesting to note the gradual disappearance of hypersecretion of hydrochloric acid and the return of the normal acidity of the stomach. The results of these cases prove that a gastric ulcer can be cured without any treatment especially directed to it, but with the removal of obstruction at the pylorus. This fact coincides with the predominant view, that narrowing of the pylorus, hyperacidity, and an ulcer are inseparably connected and dependent on one another, and fortifies the theory of Talma and Doyen, that the primary lesion is the pyloric contraction. Mikulicz outlines the indications for the three operations, resection, gastro-enterostomy, and pyloroplasty. Taking up first resection, the most dangerous of them all, and the so-called circular resection in particular, only one indication is given, namely, when there is a suspicion of carcinoma, a clinical phenomenon not infrequently met with. Segmentary or sectional resection is prescribed for ulcers on the small curvature, on the posterior wall, and in the cardiac region. When, in addition, there is marked narrowing at the pylorus, gastro-enterostomy or pyloroplasty should be employed as auxiliary procedures. For the frank gastric ulcers two operations chiefly come under consideration, pyloroplasty and gastro-enterostomy, both of which accomplish the desired end, namely, rapid and complete emptying of the stomach, but each having its special indications. Pyloroplasty is the operation of choice, in so far as it is more easy to perform and is attended with less danger. But when firm adhesions bind the organ to the anterior abdominal wall, liver, or pancreas, and when the gastric wall in the region of the pylorus and the ulcer is indurated and unyielding, this operation is absolutely contra-indicated. The author now turns his attention to some of the common complications of gastric ulcer. So far as they influence one in the selection of the appropriate operation, (1) the most frequent complication and the one for which operation gives the best results is the cicatricial pyloric stenosis, of which enough has been said. (2) Of adhesions of the base of the ulcer to the parietal wall and surrounding structures, Mikulicz recognizes two varieties, one in which the

adhesions are not firm and only a limited portion of the stomach loses its independent motion, these adhesions being the result of a benign perigastritis, the diagnosis of which from idiopathic cardialgia is extremely difficult; the second variety of the complication includes those cases where adhesions form between the base of the ulcer and the anterior parietal wall, and the resulting inflammatory infiltration forms a pseudo-tumor, which might be mistaken for a neoplasm. For these cases operation is indicated, and consists of resection of the ulcer and the infiltrated portion of the parietal wall. (3) Perforation is a complication in which the chances of spontaneous recovery are so slight that the clinician always calls on the resources of the surgeon. The mortality of the series of operations from 1885 to 1893 was 97.15 per cent., and from 1894 to 1896, 52.94 per cent. The chances for a successful operation, the author's experience goes to show, depend upon (*a*) whether the stomach is full or empty at the time of operation and (*b*) whether the operation is performed promptly after perforation has occurred. The author urges, therefore, that whenever the clinician suspects gastric ulcer he should give absolutely no food by the mouth, and should lose no time in calling in a surgeon, so that, when the diagnosis has been established, the operation may take place without delay and upon a comparatively empty stomach. As for the operative treatment of the ulcer itself, if easy of access it may be removed, but if not, simple suturing of the perforation suffices. If neither of these procedures be possible, tamponing with iodoform gauze is the course recommended. (4) Hemorrhage is a complication responsible for 50 per cent. of the fatalities. Of the numerous attempts made to locate and ligate the bleeding vessel, only two have been successful—namely, one reported by Roux and one by the author. In practice it is difficult to determine whether in a particular case life is sufficiently threatened to justify the intervention of the surgeon, while if delayed to the second or third attack he may find the patient so depressed that he shrinks from intervention. Quite the reverse is the treatment of those cases of intermittent attacks in which the loss of small quantities of blood leads to a chronic anemia. Here the indication for operation is absolute if internal treatment fails. The author refers to the diagnostic difficulties and the serious consequences which follow unrecognized cases. The diseases from which a differential diagnosis may be called for are carcinoma, gastralgia, affection of the gall bladder and ducts, causing pressure on the pylorus, adhesions of the stomach to the parietal wall, epigastric hernia, and duodenal ulcer. In concluding, the author states that the surgical treatment of uncomplicated gastric ulcer is to be adopted if (1) phenomena appear which directly or indirectly threaten the patient's life (frequent hemorrhages, increasing emaciation, beginning purulent perigastritis, suspicion of carcinoma) and (2) if repeated internal treatment gives either no result or one only of short duration, and the patient, through pain, vomiting, or dyspepsia, is seriously affected in his ability to work or to enjoy life.

FRAZIER.

The Surgical Treatment of Perforating Typhoid Ulcer. (*Annals of Surgery*, March, 1897.) By John M. T. Finney, M.D.

The history of the subject is briefly reviewed and the pathology and clinical history of typhoidal ulcers are touched upon. The author has collected and summarized all the cases that have thus far appeared in literature, a total of fifty-two, including six of his own. Excluding the doubtful ones the mortality was 26.22 %. In reviewing the whole series the following observations have been made. 1. The third week is the most frequent time for the occurrence of perforation. 2. The accident occurs more frequently in mild cases. 3. The most constant symptoms are sudden, severe abdominal pain, persisting with increasing intensity, nausea, and vomiting. 4. The earlier the operation was performed (after recovery from the primary shock) the more favorable was the result. 5. There was intense congestion of the peritoneum and viscera, a large amount of fecal pus and exudate, together with distention of the bowel. 6. The ileum in the last metre of its length was the seat of perforation in every case but one. 7. The method of resection of a portion of the bowel is uncalled for; where suturing of the perforation is unsafe or impossible, it is better to treat the perforated loop extra-abdominally. 8. The mattress sutures of Halsted are the most efficient. 9. Drainage should always be employed, but accomplished by means of wicks dusted with bismuth or iodoform carried into different parts of the cavity. 10. Appendicitis and intestinal obstruction are the diseases most likely to be mistaken for perforated typhoidal ulcers. 11. From recent observations it has been shown that towards the end of the febrile period there is a marked diminution in the leucocytes, and that immediately after perforation a very pronounced increase in the number of leucocytes takes place; it is therefore suggested that as an aid to diagnosis a systematic examination of the blood be made from the beginning in every case of typhoid fever. 12. The incision had better be made immediately over the part affected, not in the median line, and should be sufficiently large to enable the operator to explore and cleanse the peritoneum. 13. The length of time consumed in the operation played an important part in the ultimate result; therefore speed and dexterity should be cultivated. 14. The healing process was not affected by the existence of the fever. 15. In the majority of instances death was due to septic absorption. In the treatment of the ulcer itself the author mentions three things to be accomplished: 1. Finding and closing the perforation. 2. Emptying and cleansing the peritoneal cavity. 3. The establishment and maintenance of effective drainage. A description of the steps of the operation then follows. The conclusions arrived at by Finney from his study of this series of cases are as follows: 1. Of all the so-called diagnostic signs of perforating typhoid ulcer, most reliance is to be placed upon the development of an attack of severe, continued abdominal pain, coupled with nausea and vomiting, and at the same time a marked increase in the number of white blood-corpuscles. 2. The surgical is the only rational treatment of perfo-

rating typhoid ulcer. 3. There is, surgically speaking, no contra-indication to the operation save a moribund condition of the patient. An account of his own cases and a summary of those collected from literature are appended.

FRAZIER.

Two Hundred and Fifty Cases of Gonorrhea Treated by Large Douches of Permanganate of Potassium. (*Annales de la Société Medico-Chirurgicale de Liége*, April, 1897.) By Albert Hogge, M.D.

After an exhaustive study of his cases, Dr. Hogge draws the following conclusions: 1. Janet's method is abortive (cure in less than twenty days) only in one-quarter of the cases which are seen less than forty-eight hours after the demonstration of the purulent discharge. The rapid cure may be obtained in some patients presenting themselves for treatment at a later time (one-sixth of cases treated from two to fifteen days after the appearance of the discharge). 2. The method of large douches of permanganate of potassium and lime assures absolute cure in nearly every case of gonorrhea which is treated from the beginning or which has been submitted to rational treatment until the method is established. Complete cure is usually maintained. 3. This method assures a minimum of complications. Folliculitis or prostatitis may be produced by the method, and, if these have already occurred, the treatment has little influence on them. 4. It is not necessary to douche the posterior urethra systematically, but to attack it only when it becomes diseased. It is not necessary to make more than four or five posterior lavages if the second portion of the morning urine does not become clear rapidly under its action. 5. Weak solutions (1 to 8000 or 1 to 5000) appear best to produce the desired result. This method assures rapid cure and is less liable to produce complications than the method which employs stronger solutions.

SWAN.

NEUROLOGY.

The Localizing Value of Optic Neuritis in Intracranial Tumor. (*Lancet*, July 10, 1897.) By J. M. Martin, B.A., M.B., B.C. Cantab.

The writer refers to the difference of opinion existing in regard to the localizing value of optic neuritis, and gives the result of his analysis of six hundred cases. He has found that the male sex is more than twice as liable as the female to intracranial growths (68.8 % of the cases). In regard to frequency of the different growths, his statistics vary somewhat from those of Starr, who gives for sarcoma 22.6 % against Martin's 28.5 %, for glioma 17.2 % to Martin's 18.5 %, and for tuberculous tumors 36.4 %, while Martin gives only 16.3 %. Sarcoma, therefore, according to Martin, is the most common form of intracranial growth. Martin believes that headache is of no value in determining the position of the tumor, and draws attention to the rather large number of cases of tumor of the motor

area and of the callosum in which headache was stated to be absent, to the frequency of occipital headache in cerebellar tumors, and to the frequency of frontal headache in all kinds of tumors. He finds that optic neuritis is constantly present in tumor of the quadrigemina, so that in the absence of optic neuritis we can exclude this region as the seat of the tumor. The cerebellum and parieto-occipital regions come second with optic neuritis in eighty-nine per cent. of the cases. Optic neuritis is found in a comparatively small proportion of cases of tumors of the callosum, pons, or oblongata. Absence of optic neuritis early in the disease is characteristic of tumor of the pons. Martin, from an examination of the reports of fifty-five cases, believes that the seat of lesion is usually on the side on which optic neuritis is more marked, and gives the proportion as seventy-one to twenty-nine. He finds that optic neuritis is most frequently absent when the tumor is tuberculous, and most frequently present when it is a glioma, is cystic, or is a hydatid. In cases in which internal strabismus is noticed the tumor is generally on the same side as the strabismus.

SPILLER.

Chorea in the Aged, with the Report of a Case. (*Am. Journ. Med. Sci.*, August, 1897.) By David Riesman, M.D.

Riesman reports a case of chorea in a man of seventy-five, which began about eight months previously with unsteadiness of movement in the left hand, and extended to the left leg, and is still of the hemiplegic form. There are no real impairment of speech, no loss of memory, and no psychic defects. The movements are not under voluntary control. The knee-jerks are absent. The writer speaks of a class of cases which differ from chorea minor in their incurability and from Huntington's chorea in the absence of the hereditary basis, and in which no gross subcortical lesion exists. He says that practically we have but three forms of chorea in advanced life: 1, posthemiplegic and prehemiplegic chorea; 2, chorea minor; 3, chronic progressive chorea. In some of the cases of the latter type there is a distinct history of heredity. The existence of heredity seems to cause an earlier development of the disease, and predisposes to dementia and other forms of mental failure. The writer has collected the reports of sixty-five cases of chorea coming on after the thirty-fourth year, not including the cases due to gross subcortical lesions nor the cases with a distinct hereditary feature. Thirty-one occurred in men and thirty-four in women. This corresponds very closely to the proportion existing between the sexes in Huntington's chorea. The oldest case reported was eighty-seven, the youngest thirty-four, at the inauguration of the disease. Forty-two cases began after the fiftieth year. In thirteen a history of rheumatism was given; in eight endocarditis was present; in thirteen the chorea was unilateral. Mental impairment existed in twenty-seven instances. This the writer considers in striking contrast with the almost invariable existence of psychic

degeneration in the hereditary forms of chorea. He has found the reports of thirteen cases of chorea in persons ranging from forty to sixty, in which the disease terminated in recovery. His conclusions from a study of these sixty-five cases are: 1. True Sydenham's chorea may occur in advanced life and may run a short course, terminating in recovery. 2. The majority of cases of chorea occurring in advanced life run a chronic and progressive course. 3. At the commencement of the disease it is, as a rule, impossible to say whether it will terminate favorably or become chronic. 4. The movements are generally most marked in the arms; they may begin in the lower extremities and rarely may remain confined thereto. In 20 % of the cases in the table they were unilateral. 5. The mind is normal in three-fifths of the cases in which no hereditary element exists. 6. Rheumatism holds a very subordinate relation to the chorea of late adult life. 7. Endocarditis is comparatively rare, having occurred in only 12.3 % of the cases collected in the table. 8. The anatomic lesions in the fatal cases are not characteristic.

SPILLER.

On the Knee-Jerks in Diabetes Mellitus. (*Lancet*, July 17, 1897.) By R. T. Williamson, M.D., M.R.C.P. Lond.

It has been known for many years that the knee-jerk may be absent in diabetes mellitus. Williamson stated in 1892 that he had found both the knee-jerks absent in one-half of fifty cases examined. Previous statistics given by other examiners differed greatly. The very small number of cases in which Grube found absence of the patellar reflex induced Williamson to examine a second series of fifty cases. Of these he found that both knee-jerks were absent in twenty-four, both were present in twenty-three, and one was absent and one present in three. He used Jendrassik's method, and wherever a slight indication of a knee-jerk was obtained the case was classed among those in which the reflex was present. The patients were examined repeatedly. Williamson explains the discrepancy between his statistics and those of Grube (13.5 %) by stating that many of his (Williamson's) cases were in advanced stages of the disease, many were hospital patients, and eighty-one of his hundred patients were under fifty years of age. He says it is well known that the severity of the disease is much less in persons over that age. Grube's patients were probably in a better social position and in earlier stages of the affection. Williamson found that the patellar reflex frequently disappeared as the disease progressed, and that it could not be obtained in the majority of cases of diabetic coma. The changes found in the spinal cord or peripheral nerves of certain cases may explain the loss of reflexes in these cases, but, where no pathological findings have been obtained, either the technique has not been perfect, or else the loss of the knee-jerk has been due to some functional change in the cord, nerves, or muscles.

SPILLER.

A Contribution to the Study of Cerebral Muscular Atrophy and of the Trophic Functions of the Neurones. (*Monatsschrift f. Psychiatrie und Neurologie*, Vol. II., No. 1.) By Karl Schaffer, M.D., of Budapest.

Schaffer believes that muscular atrophy occurs regularly in cerebral hemiplegia, and that the degree of the atrophy is usually great. In some cases it occurs in a diffuse, in others in a localized form, and it decreases in intensity from the proximal portion of the upper extremity downward, *i. e.*, it is most perceptible in the arm, less so in the forearm, and still less in the lower limb. In rare cases the atrophy may also be seen on the unparalyzed side. Schaffer has observed quantitative change in the electric reactions and slow contraction of the muscles, but never complete reaction of degeneration. He reports the microscopic examination of three cases of hemiplegia with muscular atrophy. In one case the anterior horn of the cord on the side of the degenerated crossed pyramidal tract was smaller than the one on the other side and contained fewer cells ; in a second case atrophy of the anterior horn at the seventh cervical root was noted ; and in a third case (hemiplegia of forty-eight days' duration) the Nissl stain showed chromatolysis and rarefaction of the cells of the posterolateral group, most marked in the cervical region at the level of the seventh segment and on the side of the degenerated crossed pyramidal tract. A few degenerated cells were seen also in the opposite anterior horn. The difference between the cells of the posterolateral group and the other cells of the horn was striking. The thoracic cord was normal. In the lumbosacral region the degenerated cells were numerous, and were in the same group as the cervical cord. These cases, Schaffer thinks, prove the spinal origin of the muscular atrophy in hemiplegia. The integrity of the motor spinal cells depends on two factors,—on the normal nourishment from the circulatory apparatus and on the existence of cortical influence. In a former work Schaffer has shown that the motor spinal cells are altered in the tabetic degeneration of the posterior roots. After the degeneration of the pyramidal tract from cerebral hemorrhage the motor cells in the cord of the peripheral neurones show chronic degenerative changes, while the axis cylinders having exit from these cells present no signs of alteration. The same is true of the alteration of these cells in tabes, but degenerative changes may be found in the intramuscular ramifications of the neurones. As the cellular degeneration increases in intensity the degeneration of the axis cylinder approaches the cell body. This ascending degeneration of the neurone occurs in amyotrophic lateral sclerosis and progressive spinal muscular atrophy, and its extent is proportional to the degeneration of the cell body. The alteration of the central motor neurone may be secondary to the alteration of the peripheral motor neurone,—*i. e.*, in the opposite direction to which the nerve current is usually transmitted,—or that of the central sensory neurone may be secondary to that of the peripheral sensory neurone.

SPILLER.

PATHOLOGY.

Successful Cultivation of Gonococcus in Two Cases of Gonorrheal Arthritis and One of Tenosynovitis, with Remarks on a New Medium. (*Johns Hopkins Hospital Bulletin*, June, 1897.) By Francis R. Hagner, M.D.

Acid urine containing 0.05 per cent. or more of albumin should be collected and allowed to stand for twenty-four hours, no effort being made to prevent decomposition. The urine is then boiled until a large albuminous precipitate is formed; it is filtered through paper, when the resulting fluid will be clear. The filtered urine is boiled, and agar-agar, peptone, beef-extract, and sodium chloride are added in the same proportions as in making ordinary agar. Before placing the medium in tubes it is important that it should be neutral or slightly acid in reaction. The gonococcus was grown on this medium from the fluid of an arthritis in two cases, and from one case of tenosynovitis.

SWAN.

A Case of Typhoid Fever in which the Typhoid Bacillus was obtained twice from the Blood during Life. (*Johns Hopkins Hospital Bulletin*, June, 1897.) By E. Bates Block, M.D., of Baltimore.

The author reports the case of a woman, aged thirty years, who had typhoid fever, during the course of which the typhoid bacillus was obtained from the blood twice, at intervals of three days. The diagnosis was confirmed by autopsy.

SWAN.

Anatomo-Pathologic Lesions of the Spleen in Asiatic Cholera and in Cholera Nostras. (*Bulletin de l'Académie Royale de Médecine de Belgique*, No. 1, 1897.) By Dr. Van Der Stricht.

The author has made autopsies on three bodies which were dead of Asiatic cholera, and on one body which was dead of cholera nostras. He has examined the spleen carefully in each case and has studied, first, the lesions of the Malpighian corpuscles, and, second, of the splenic pulp. In the Malpighian corpuscles the following changes may be noted: 1. The emigration of a large number of lymphocytes, which leave the central portions of the Malpighian corpuscles to enter the general circulation and thence to be sent to the inflamed organs. 2. The lymphocytes which remain in the Malpighian corpuscles undergo indirect division, in order to replace the lymphocytes which have emigrated. 3. Disintegration by chromatolysis of many of the lymphocytes and the simultaneous appearance of phagocytes. The latter have their products of destruction transformed into nutritive materials and into chemical principles which enter into the composition of the blood serum. In addition to these changes in the Malpighian corpuscles small areas of hemorrhage and of hyaline degeneration of

the reticular tissue may be noted. The splenic pulp is anemic and the venous capillaries are obliterated. The number of lymphocytes is diminished and the number of phagocytes, on the other hand, is increased. These phagocytes contain fatty and pigmentary granulations. It would seem, therefore, that there is a double current in the spleen—a current of emigration of lymphocytes from the Malpighian corpuscles towards the inflamed organs and a current of immigration of phagocytes.

SWAN.

OBSTETRICS AND GYNECOLOGY.

Ovarian Tumor with Pregnancy. (*Lancet*, July 17, 1897.) By Sir John Williams, Bart., M.D.

This subject is important because of the high mortality. Pregnancy is not a cause of such growths; they are more common in proportion in single women and become rarer with each successive pregnancy. The process of gestation does not seem to give any impulse to the growth of the tumor, nor is there any constant change after labor. Pregnancy does not cause malignant degeneration of benign growths. The effects of gestation, delivery, and the puerperium upon ovarian growths are twisting of the pedicle, rupture and laceration of the tumor and their consequences, hemorrhage into the cyst, and suppuration. The influence of the growths on pregnancy is to produce abortion in about 12 % of the cases, cancer causing the highest percentage, cystic growths next, and dermoids and other solid tumors the lowest. The part played by these tumors in labor depends upon their position if in the pelvis, and upon their size if in the abdomen; 40 % of labors are normal. The operations that may be resorted to are raising the tumor, forceps, version, craniotomy, tapping the tumor, and celiotomy. The mortality of this condition is only exceeded by puerperal fever, death being rare in pregnancy without interference but frequent after labor. The treatment is removal during pregnancy, which has but half of the mortality of labor with ovarian tumor and gives the best results. At term it may be necessary to do Cesarean section.

GIRVIN.

On the Culture Diagnosis and Serum Treatment of Puerperal Infection, with Illustrative Cases. (*Edinburgh Medical Journal*, August, 1897.) By F. W. N. Haultain, M.D.

The cases reported are, first, a primipara, who, on the thirtieth day, developed high fever, rapid feeble pulse, and severe constitutional symptoms, associated with pain and swelling of the left thigh and calf. Agar-tube cultures from the cervical canal and blood from the finger showed typical pure cultures of the Löffler bacillus. Three injections of 10 c. c. each of antidiphtheritic antitoxin were followed by recovery. The second case de-

veloped high fever and rapid pulse, with chill, forty-eight hours after a normal delivery. On the fourth day the abdomen was swollen, and slight elevated erythematous patches appeared on the legs and abdomen. She also developed an intense and constant diarrhea and other signs of general infection. An agar-tube culture taken from the cervical canal on the fifth day showed streptococci and *Bacillus coli communis*. Two injections of 10 c. c. and one of 30 c. c. of antistreptococcic serum produced no benefit, and she died on the thirteenth day. A culture taken from the finger on the twelfth day showed a pure culture of *Bacillus coli communis*, very active and virulent. The third case developed delirium, chills, fever, and rapid pulse on the third day, associated with a fetid discharge and enlarged uterus, but no other signs. Here no culture was made, but cover-glass preparations showed streptococci. Two injections were used and the uterus was douched and packed with gauze soaked in the serum. Two days later the patient was recovering, but streptococci were still present, which disappeared later after repeated douches, and the patient made a rapid recovery. From these cases the author points out the value of this method from the stand-point of diagnosis, prognosis, and treatment. As to diagnosis the microscope shows the presence of the organism, but not its virulence and vitality, as shown in the third case. The author also thinks that, after careful prolonged culture-study of these cases, we shall be able to associate certain clinical phenomena with each form of infection, as the diarrhea and erythema in the *Bacillus coli communis* infection and the marked weakness and rapid feeble pulse with no local symptoms in the diphtheria case. In the prognosis the culture method shows not only the form of infection, but also the number of organisms and their virulence and vitality. The author thinks that diphtheria and pure streptococci infection offer the best prognosis, while the streptococci and staphylococci infection is much more dangerous and the streptococci with *Bacillus coli communis* almost always fatal. The serum treatment gives good results in simple infections, and should be used in mixed with the hope of bettering the condition by destroying one form of the infection. But little can be expected from this form of treatment until it is shown that it has germicidal properties as well as antitoxins. Injection without culture is unscientific, but may do good and is little likely to do harm. The author urges that other treatment be always associated with the serum, as the injection of nuclein, douching, and packing with gauze soaked in serum. He also advocates the routine administration of a one to forty carbolic acid douche immediately after every labor. In conclusion he decides that the benefits of serum treatment are not yet proved, but promise to be of much value; that it should be adopted early and continued late; that it is of diminished value in mixed infections; that it should never be relied upon alone; and that, if possible, a culture should always be made to assist in furthering scientific investigation from a clinical stand-point.

GIRVIN.

The Prevention of Puerperal Fever in Lying-in Hospitals connected with Teaching Institutions. (*Volkmann's klin. Vorträge*, No. 65.) By M. S. Hofmeister.

This is a report of the third thousand cases of labor occurring in the lying-in hospital at Würzburg, with a mortality of nine. There were, however, only two deaths attributable to puerperal fever and one to pyemia. The total morbidity was 89, including all cases in which the temperature at any time rose above 30° C., whether the rise was due to the confinement or not. In 41 of these the cause of the rise was referable to causes unconnected with labor, such as pleurisy, phthisis, etc.; twenty were more or less severe cases of puerperal infection. The author believes that this favorable result is to be attributed to the method of disinfection which was introduced into the clinic at Würzburg as a result of the investigation of Steffeck. This method of prophylactic disinfection consists in the careful cleansing of the vulva and labia with a 1 : 2000 solution of corrosive sublimate, two fingers are then introduced into the vagina and the os is thoroughly rubbed and irrigated with the above solution. This is repeated after each examination. In exceptional cases the uterus and the vagina are disinfected with a two-per-cent. solution of lysol. During the lying-in period the external parts are irrigated; when the lochia are foul the vagina is also irrigated; where there is pronounced endometritis the uterus is irrigated, if necessary, with a twenty-per-cent. alcoholic solution of phenol. The author quotes statistics to show that no other method gives so high a degree of protection. He protests against the theory of self-disinfection of the vagina, and calls attention to the persistent virulence of the gonococcus in the vagina and os and its significance in the puerperium. Where pronounced infection exists he recommends painting the os and vagina with a strong solution of nitrate of silver.

MUEHLECK.

The Bicycle for Women. (*Revue médico-chirurgicale des Maladies des Femmes*, April, 1897.) By Dr. Fauquez, of Paris.

Both as a form of exercise and as a means of locomotion bicycling is unrivalled. It is easy, simple, and economical; it develops all the muscles of the body, stimulates the respiratory and circulatory functions, and improves the appetite and digestion. There is no comparison between running a sewing-machine and riding a bicycle; the muscular action is totally different. In running a sewing-machine only one joint is brought into play; the ankle and the muscles of the thigh are kept in a state of constant tension to maintain the heel as the pivot on which the foot moves. The circulation of the upper part of the leg is thus impaired and the pelvic congestion is increased. In bicycling, however, three joints are brought into action, the ankle, knee, and hip. The motion is one of natural flexion and extension for all the muscles of the leg, and the circulation, instead of being impeded, is stimulated throughout the whole limb, thus relieving any

congestion of the pelvic organs. "Unless there are contra-indications, we may assert that the exercise of bicycling is excellent for women, and that in many cases the sexual organs are all the better for it." It should not be indulged in to excess, either as regards speed, distance, or hill climbing. Corsets should be proscribed absolutely, as interfering with the proper expansion of the chest and destroying all suppleness of motion. The use of the bicycle should be advised for women with normal sexual organs; for those suffering from anemia, chloro-anemia, dyspepsia, neurasthenia, sterility, and obesity; for girls in whom the menstrual function has not been established, and for women who suffer with the symptoms of the menopause. Among diseased conditions of the sexual apparatus we may advise it in (1) uterine congestion; (2) amenorrhea or suppression of menstruation due to arrested development of the ovaries and uterus, to anemia, chloro-anemia, dyspepsia, neurasthenia, and chronic diseases, to disturbances following physical and mental shocks, chills, falls, injuries, vivid impressions, fright, and sorrow; (3) dysmenorrhea due to nervous disorders; (4) congestive dysmenorrhea due to any causes capable of producing congestion of the utero-ovarian apparatus, shocks, physical or moral; (5) vicarious menstruation; (6) fibroid tumors when there is no longer a tendency to hemorrhage. Bicycling may be permitted in cases of (1) dysmenorrhea, mechanical or membranous; (2) displacement of the uterus; (3) chronic metritis due to subinvolution when not painful and when on the road to recovery, but only in moderation; (4) leucorrhea in anemic women and in those in generally feeble health. It should be proscribed absolutely in (1) amenorrhea in connection with phthisis, cancer, diabetes, organic diseases of the heart, Bright's disease, and albuminuria; (2) metrorrhagia and menorrhagia; (3) inflammatory conditions of the uterus and its adnexa,—namely, acute metritis, chronic painful metritis, hemorrhagic endometritis, septic endometritis, leucorrhea due to endometritis, inflammations of adnexa, salpingitis, ovaritis, perimetritis, pelvic cellulitis, pelvic abscess; (4) pelvic hematocele and fibroid tumors causing hemorrhage; (5) vulvitis and vaginitis before the cure has been completed.

L. S. Smith.

An Operation for Vaginal Cystocele. (*Centralblatt f. Gynäkologie*, February 20, 1897.) By R. Gersuny.

The operation begins with a median longitudinal incision through the vaginal mucous membrane from the anterior lip of the cervix to the urethral prominence. The bladder is then dissected off on either side of the wound for a distance varying according to the size of the cystocele. From one to four rows of continuous catgut sutures are inserted so as to draw the redundant bladder wall into a ridge antero-posteriorly in the interior of the bladder. The superfluous tissue of the anterior vaginal wall is then trimmed off, and the edges are brought together in the median line by one or more continuous catgut sutures. In order to avoid cutting away

too much tissue the sutures may be placed so as to cause a ridge of vaginal wall to project into the vagina. The advantages of this operation over the ordinary anterior colporrhaphy are that it folds the redundant bladder wall into a ridge, does not throw the tension upon the vaginal stitches, and that it brings the edges of the attenuated connective tissue lying in the visico-vaginal septum together and unites them firmly in the median line, thus restoring the natural support of the bladder.

L. S. Smith.

Cranio-Cephaloclasis. (*Centralblatt f. Gynäkologie*, May 8, 1897.) By Professor Zweifel, of Leipzig.

In this article are described the uses and advantages of an instrument combining all the good points of Auvard's cranioclast and Tarnier's three-bladed basiotribe. It consists of three blades: a conical screw perforator that is introduced first, and may be screwed into the base of the skull to steady it, and two serrated blades, concaved inwardly, that are applied over the occiput and face. All three blades lock together on one pivot, or any two may be used without the third. The crushing force is applied by a screw adjustable to any two of the blades. If the perforator is not needed the two outer blades form a powerful cephalotribe, while one outer blade with the perforator makes an excellent cranioclast. The whole instrument is forty-two centimetres in length. This instrument Zweifel considers "capable of meeting the requirements of any emergency in practice; it perforates, compresses, and extracts the head, and performs the comminuting operations without danger to the mother." (Made by Alexander Schädel, in Leipzig.)

L. S. Smith.

A Case in which Conception occurred after the Curettement of a Cervical Carcinoma. (*Centralblatt f. Gynäkologie*, May 8, 1897.) By Eduard Leinzinger, M.D.

The history of this case, from the Universität's Frauenklinik in Graz, is as follows: A woman, forty-one years old, was curetted for an inoperable carcinoma cervicis. All bleeding ceased, and she enjoyed good health for more than ten months. One year after she was readmitted to the clinic in a weak, anemic condition, with an enlarged uterus, an extension of the carcinomatous growth, but without any important local symptoms. The new growth was again curetted and a sound was passed into the uterus for diagnostic purposes, but no suspicion of pregnancy was entertained. Three days after a macerated fetus of about eighteen weeks was expelled, and the patient died of sepsis on the eleventh day. The first curettement had a beneficial effect, the pregnancy had no apparent stimulating effect upon the growth of the carcinoma, and the patient had no subjective or objective symptoms of pregnancy except the enlarged uterus. The highly anemic state of the patient and her pregnant condition were favorable factors for the occurrence of infection.

L. S. Smith.

Regeneration of the Endometrium after Cauterization with the Chloride of Zinc Paste of Dumontpallier. (*Centralblatt f. Gynäkologie*, May 8, 1897.) By Dr. Jung, of Breslau.

The patient whose history forms the basis of this report suffered from obstinate metrorrhagia due to endometritis. After several ineffectual curettings the uterus was finally packed with a paste of one part of chloride of zinc and two parts of rye flour mixed with a little water. Five days later the mass of paste, surrounded by a complete cast of the uterine wall, was expelled. The cast varied in thickness from two or three millimetres at the fundus to three-fourths of a centimetre at the sides, and, except over a small area at the fundus, included a layer of muscular fibres. Nearly four months later the recurring hemorrhages made recourse to a vaginal hysterectomy necessary, and it was found that in the mean time a mucosa presenting the original pathological changes had developed sufficiently to line the whole cavity of the fundus. The author points out the practically inexhaustible power of regeneration possessed by the mucous membrane of the uterus, and concludes that chloride of zinc should not be used either in intra-uterine injection or in a paste.

L. S. Smith.

A Case of Prolapse of the Rectum following an Operation for Complete Procidentia Uteri. (*Centralblatt f. Gynäkologie*, January 30, 1897.) By Dr. Westphal.

Four weeks after a ventro-suspension combined with an anterior and a posterior colporrhaphy had been performed for a complete procidentia uteri, a prolapse of the rectum of about fourteen centimetres was observed. This was cured by an excision of thirteen centimetres of the rectum and a suturing of the wound. The patient was perfectly well six months after.

L. S. Smith.

A Case of Myxoma of the Labium Majus. (*Centralblatt f. Gynäkologie*, January 30, 1897.) By M. Graefe.

The patient presented a hemispherical tumor, the size of a fist, painful on pressure, distending the left labium majus. It was not very tense, but felt rather as if it were filled with intestinal coils. The diagnosis rested between an omental hernia and a lipoma. On incising the skin covering it, the tumor shelled out easily, and proved to be a pure myxoma made up of numerous small nodules like a bunch of grapes. It had been, in all probability, originally a fibroma.

L. S. Smith.

The Indications for Myomotomy. (*Monatschrift f. Geburtshülfe und Gynäkologie*, February, 1897.) By Paule Ruge, of Berlin.

A myomotomy is a much more serious operation than an ovariotomy, and, while an ovarian tumor should always be operated upon, myomata should

not be interfered with unless certain definite indications render interference justifiable. The advice to operate upon every case of myoma is absolutely wrong, the dangers of the operation being too great even with the improved technique now employed. "Indications for a myomotomy are given only by symptoms dangerous to the life of the patient, or by distress that is unbearable and therefore to be relieved." When discovered at an operation undertaken under a false diagnosis, a myoma is to be removed, as its removal then does not endanger the life of the patient as much as a subsequent operation necessitated by the possible growth of the tumor. The other indications are cachexia with influence upon the heart's action, pain, ascites, an occasional symptom of subperitoneal myomata, suppuration or putrefaction of the tumor, symptoms of strangulation unrelievable by a pessary, prolapse, and pressure edema. Rapid growth is not an indication unless its occurrence in the climacteric causes suspicion of malignant degeneration, or it causes physical distress or mental anxiety to the patient. "The principal indication for a myomotomy is and will continue to be hemorrhage." While too great haste in operating should be avoided until other means of checking the hemorrhages have been tried, still, on the other hand, too long a delay may give rise to a highly anemic condition, with secondary cardiac degeneration, or may lead even to death from loss of blood. It is in the decision of the question when to operate that good judgment is required. Ruge believes that better results are obtained by the vaginal than by the abdominal method. Castration is too uncertain in its effect upon the tumor to be relied upon.

L. S. Smith.

Intra-uterine Colpeurysis. (*Centralblatt f. Gynäkologie*, February 13, 1897.) By Ottocar Gerich, M.D.

Gerich reports five cases in which he employed intra-uterine colpeurysis with most satisfactory results. In the first case he was able to dilate the cervix in four minutes sufficiently to extract the colpeurynter, turn and deliver the child. The second case required seven minutes, while the other three took longer, owing to faulty elasticity of the dilating bags. The delivery in these cases followed in one hour, three hours, and three-fourths of an hour, respectively, after the traction upon the colpeurynter was begun. Dilatation of the cervix preparatory to the insertion of the bags was not necessary in multiparæ.

L. S. Smith.

PEDIATRICS.

Experiments in Regard to the Feeding of Premature Infants. (*L'Obstétrique*, March and May, 1897.) By P. Boudin and C. Michael, of Paris.

The feeding of premature infants is unsatisfactory, because either their digestive organs do not secrete the juices capable of digesting the milk

properly, or the organs themselves are not able to absorb the products of digestion. Any improvements in the methods of feeding must come through investigations along the line of the first hypothesis. Boudin and Michael have, therefore, attempted to discover the most readily digestible form in which milk may be given to supplement human milk. The high price and difficulty of preserving ass's milk renders its use impracticable. Cow's milk is cheap and may be obtained in good condition, but it is often quite indigestible even for vigorous, healthy infants, and therefore is not borne by premature ones unless it has been subjected to changes rendering it more like human milk. Human milk being richer in sugar and poorer in salts and albumin than cow's milk, experiments at modification of the latter have resulted in milks modified by the addition of water and lactose, in decaseinated or humanized milks, and in the so-called maternalized milk, but they resemble cow's milk more closely than they do the one they are intended to imitate. It is not sufficient to modify the proportions of the various constituents of cow's milk, but the chemical nature of those constituents must be altered also. By artificial digestion the casein in cow's milk may be converted into peptones, more easily digestible substances, and thus a form of food is furnished the infant that requires much less labor to reduce it to a condition in which it may be assimilated. After unsatisfactory results were obtained by different methods of peptonizing the milk and also with pancreatin, the authors tried partially digesting it with macerated calf's pancreas. The pancreases of calves just killed are stripped of their surrounding fat, then chopped very fine and allowed to macerate for twenty-four hours in twice their weight of water saturated with chloroform. The whole is filtered through a cloth, the filtrate allowed to stand, and the clear portion is decanted as needed. This filtrate is very active from a digestive stand-point, and may be kept several days if the saturation with chloroform is maintained. Fifty c. c. of the above filtrate are added to one litre of sterilized milk cooled to 40° C. The mixture is stirred and then placed for one hour in an oven kept at a temperature of 40°. The milk should be shaken from time to time during the digestion. It soon loses its opacity, becoming translucent, and no longer coagulates on the addition of dilute acetic acid. After digestion has continued one hour the following solution is added: lactose, 4.4 g. (69 gr.), simple syrup 50 g. (750 gr.), water, q. s. ad 500 c. c. The mixture is then poured into flasks of from 100 to 200 c. c. and sterilized on a hot-water bath after the method of Soxhet. It must be used within twenty-four hours. The composition of the product per litre is as follows: lactose 46.6 g., cane sugar 20.8 g. (67.4 g. of saccharine matter), butter fats 26.6 g., albumin 23.6 g., salts 4.5 g. Its color is white or very light brown; its odor presents nothing peculiar—it is that of ordinary sterilized milk; its taste is sweet and very slightly bitter. Before sterilization it is an emulsion like cow's milk, but differs from it in that the addition of dilute acetic acid throws down only a slight precipitate; its albuminous

constituents are partially digested. During sterilization its albumin is coagulated to a slight extent and collects upon the surface with the fats; shaking at a temperature of 37° C., that at which it is given to the infant, reëmulsifies it. In a series of experiments upon young dogs the nutritive value of the milk seemed unimpaired by the artificial digestion, and its usefulness was then tried upon 54 infants in conjunction with milk from wet-nurses. Nine of the most characteristic histories and weight charts are given, and the results of the feeding seem to justify the hopes of the experimenters. "We have administered it to infants born before term, concurrently with human milk, and we have never seen the least accident, and in a good number of cases we have seen the feeble organism make relatively large gains in weight, proving that the materials ingested were assimilated."

L. S. Smith.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

LEGAL LIABILITY OF THIRD PERSON CALLING IN A PHYSICIAN.

In a recent action[1] by a physician to recover compensation for his professional services, it was held that one who requests a physician to attend another person professionally, without disclosing the fact that he acts as agent or messenger, is liable for the physician's charges. The services were rendered to defendant's father, since deceased. There was no dispute about the rendition of the services or their value; the only question was as to liability. The defendant, a son of the decedent, contended that the claim is one against his father's estate; while the plaintiff asserted that there is no estate to look to, the father having left no property, and that the defendant, by his conduct, made himself personally liable. From the evidence it appeared that the defendant called upon Dr. K., and said, "Doctor, I want you to come and attend my father. He had a doctor who was not satisfactory." The doctor thereupon visited the father, and rendered the services for which compensation is claimed. After the death of the patient, the doctor sent his bill to the defendant, who replied that the estate should be charged with the amount; and there was evidence that the defendant told him to send the bill against the estate to his brother, and that he (the defendant) would see it paid. Upon these facts there was a verdict for the plaintiff, from the judgment on which the defendant appealed.

[1] Foster *vs.* Meeks, 41 N. Y. S. 950.

In reviewing the case on appeal, Mr. Justice McAdam said, "We think the testimony is sufficient to warrant the finding. If the father had requested the son to go for the doctor, and, acting on this authority as agent merely, the defendant had delivered the message to the doctor, no liability would have attached. But there is no evidence in the case that the father ever directed the defendant to go for the doctor, and there is nothing from which it may be inferred that the defendant acted merely as messenger. Indeed, his language would seem to negative that. He said, 'Doctor, I want you to come and attend my father;' not that the father wanted the doctor to come, or that the defendant was acting in a representative capacity. The language plainly implies that the defendant was not acting as messenger, but on his own behalf. Where a person seeks to avoid personal liability for his acts, he should disclose that he is acting as agent only.

"In Bradley *vs.* Dodge[1] it was held that where a person called at the office of a physician, and, in the absence of the latter, left his business card (with 'call on Mrs. D——, at No. — Broadway,' written on it) with a clerk in the office, requesting him to hand it to the physician, and to tell him to 'come as soon as possible,' such person becomes liable to pay the physician's bill in attending upon Mrs. D. in pursuance of the message. The defendant in that case relied on Buck *vs.* Amidon[2]; but the court said, 'In that case the defendant exhibited to and left with the plaintiff the telegram he had received, which, as well as the other facts and circumstances, clearly showed that he only acted as the agent of another party. In the case at bar, on the other hand, there was nothing on the card to indicate to the plaintiff, before he rendered the services, that the defendant had called at his office at Mrs. D.'s request, and that he was therefore only acting as her messenger. The defendant might very readily have screened himself from all liability by simply writing the memorandum on a blank card, or adding to that which he wrote on his own card something that would have apprised the plaintiff of the fact that he acted in the transaction for Mrs. D. as her agent. Having neglected to do this, the plaintiff was, under the circumstances, justified in believing that he was employed, and would be paid, by the defendant; and that Mrs. D.'s name was put on the card only for the purpose of indicating the person whom the defendant wished him to attend on his account. If, however, there can be any doubt on this point, the same was disposed of by the verdict of the jury' (which was in favor of the plaintiff)." And, on the authority of Bradley *vs.* Dodge, the justices all concurred in affirming the judgment with costs.

[1] 45 How. Pr. 57. [2] 4 Daly, 126.

BOOK REVIEW.

LECTURES ON RENAL AND URINARY DISEASES. By Robert Saundby, M.D. Philadelphia: W. B. Saunders. 1897.

This is a republication in a single volume of two separate books by Saundby, one, entitled "Lectures on Bright's Disease," which came out in England in 1889, and the other, "Lectures on Diabetes," which was published in 1891. The author has added a fourth section on miscellaneous affections of the kidneys, such as Stone in the Kidney, Hydronephrosis, Pyelitis, Hematuria, and Hemoglobinuria. The work is a valuable contribution to the subject, and is particularly strong on its pathological side. A valuable feature is the placing of an extensive bibliography at the end of every chapter.

The chapter on the Pathological Relations of Tube Casts gives a most satisfactory solution of what has long been rather a vexed question. The author considers casts of any kind as significant of at least temporary disease in the kidneys. Blood casts he considers as evidence of hemorrhage from the glandular substance of the kidney, epithelial and broad hyaline casts as evidence of acute and subacute inflammation of the kidneys, while slender hyaline casts he regards as evidence of a mild inflammatory process only, which may be the result of a transient irritation.

The chapter on the Pathology of Uremia contains an elaborate consideration of this branch of the subject, with a very full bibliography, but ends with the virtual admission that we do not yet know what uremia is. The weakest part of the work is the chapter on the Treatment of Bright's Disease. The advice here as to climate and clothing is unexceptionable, except that the author is evidently unfamiliar with the numerous dry and fairly equable climates to be found in the United States and other parts of the continents of North and South America. But his suggestions as to diet are open to criticism. He says that when the disease is chronic the only general restriction to be laid down is, "eat sparingly of butchers' meats and avoid spirits, malted liquors, and strong wines." It is safe to say that few patients with chronic Bright's disease would make favorable progress upon a diet so little restricted as this. The author's advice relative to drug treatment is not altogether satisfactory. He gives as a routine treatment for all cases either a mixture containing sulphate of iron and sulphate of magnesia, with dilute sulphuric acid, or another mixture containing tincture of digitalis, iodide of potassium, and aromatic spirits of ammonia, and advises the occasional use at bedtime of a pill consisting of euonymin, aloes, and belladonna. He offers no suggestion as to how the physician shall decide whether the case requires the iron and acid, or the iodide and alkaline mixture plus digitalis. Under the subhead of Albuminuria he discusses the possibility of exercising control over the quantity of albumen lost, and reaches the decision that we have no drugs capable of effecting such a result. The directions as to the treatment of the more familiar complications of Bright's disease are more useful and practical. Indeed they cover the ground very completely.

The chapter on Clinical Examination of the Urine contains quite a full summary of nearly all the important methods and processes used at the present day in analyzing the urine. The different forms of diabetes are discussed with an intelligence and clearness which leave little to be desired. This forms the most valuable part of the work. The subject of the diet in this disease is treated with unusual thoroughness and good judgment, while much more is made of the medical therapeutics than is usual with authors. The chapters on Miscellaneous

Renal Diseases are necessarily too much condensed, but contain a great deal of valuable and practical matter arranged in a most convenient form for reference.

The book as a whole supplies a real want, and should be in the library of every general practitioner at least. The mechanical execution, though not up to the best standard of this publisher, is creditable, the type being clear and the paper good.

BOARDMAN REED.

NOTE TO CONTRIBUTORS.

AUTHORS will receive liberal compensation for all accepted articles after publication; or 250 reprints, if asked for on the manuscript, will be furnished in lieu of the honorarium. It is distinctly understood that all articles appearing as original matter are for our exclusive use, and are not to be reprinted or to appear in any other publication excepting the Transactions of the Society before which the paper may have been read. Illustrated papers are especially desired.

All matters of business, as well as subscriptions, should be sent to the INTERNATIONAL MEDICAL MAGAZINE COMPANY, 3709 Spruce Street, Philadelphia.

Manuscripts, exchanges, and books for review should be addressed to the Editorial Office, 3709 Spruce Street, Philadelphia.

INTERNATIONAL
MEDICAL MAGAZINE.

Vol. VI.] NOVEMBER, 1897. [No. 11.

ORIGINAL COMMUNICATIONS.

REPORT OF FIVE CASES OF ERYTHEMATOUS HYSTERICAL DERMATONEUROSIS.

BY ARTHUR VAN HARLINGEN, M.D.,
Philadelphia.

In a paper read before the College of Physicians of Philadelphia recently,[1] and in which I have collated and classified the various skin manifestations met with in the hysterical condition, I have called attention to the fact that these affections belong, for the most part, to the class of vaso-motor disturbances, and that they constitute a series of which emotive erythema forms the first and gangrene the final term.

The cases which I am about to report are to be considered as belonging near the beginning of this series. An erythematous element is always present, and forms the base of the lesion, or at least the process from which it develops.

Similar cases may be found scattered through the medical literature of the past thirty years, but until quite recently their true character has been misunderstood, at least by most observers, who have considered the affection as feigned or factitious.

A notable exception to the general rule, however, is to be found in the observations of Wilson. Erasmus Wilson was one of the first observers, and in fact almost the only one for many years, to take the view that some, at least, of the so-called "feigned" eruptions are unfeigned. In his "Lectures on Dermatology" (London, 1875) he reports, under the title "Neurotic Excoriations," several curious cases which are closely analogous at almost every point with those I am about to describe.

It may be of advantage by way of introduction to give an abstract of some of Wilson's cases.

The first of these was that of a lady of forty-seven, whose face was

[1] The Hysterical Neuroses of the Skin, Trans. Coll. Phys. Phila., 1897; Am. Jour. Med. Sci., July, 1897.

spotted over with oval or squarish excoriations. The patient's attention was first directed to their existence by a sensation of fulness, burning, or tingling. She was driven to scratch or rub the places, with the effect of detaching the cuticle, which very easily slid off the spot, bringing into view an excoriated patch which bled very readily. They presented at first the appearance of a slight redness on an indurated base without prominence. If left to themselves the lesions gave rise to a small blister, followed on healing by a pigmentary stain. The eruption came out in crops of a few lesions at a time and lasted nearly two years.

The second case was that of a young lady of fair health but of hysterical antecedents, who was attacked by pain and stiffness in the right elbow with a sense of weight in the forearm. Next day there appeared on the inner side of the forearm a few small, circular, red spots; they were attended with soreness. Then they felt hot and burning and the cuticle was slightly raised; next the cuticle broke or was rubbed off, and an issue of a serous fluid took place somewhat copiously. Subsequently the discharge took on a sero-purulent appearance. When examined by Wilson the whole ulnar side of the forearm showed a diffused or mottled redness, with the lesions above described scattered over it. There were extreme hyperesthesia and some swelling of the tissues. In places there were excoriations and what looked like the effects of scratching.

The third case, that of a school-girl, showed lesions somewhat similar to the first, occurring on the right side of the face. Wilson discusses the question of malingering in this case. It appeared that the first attack had occurred when it had been proposed to send the girl to boarding-school, and had passed away when a trip to Paris had been suggested instead. Having been placed at school, the eruption returned, but again disappeared when the girl was taken home. Being sent to school once more, the same consequences ensued, but, in addition, her general health was evidently compromised. She was brought home, and, as before, recovered in a short space of time. The fourth attack was brought on by the mere mention of school, but this attack passed off on the decision being arrived at to keep the young lady at home, and her health became completely restored.

I may mention here a case reported by Bulkley,[1] in which lesions closely resembling those above described occurred in a highly hysterical girl of sixteen. These patches came and went as the patient was sent to a watering-place which she disliked, or to another to which she wished to go.

Wilson goes into the question of malingering in his cases at some length, and, after demonstrating that the lesions as he observed them could not, apparently, have been caused by any known artificial means, says: "My own very decided opinion on the subject, founded upon a careful and anxious study of the affection, is that it is not the product of malingering, but that it is a well-defined form of cutaneous disease of neuropathic origin. It may be difficult at first sight to discover the relations

[1] A Case of Feigned Eruption, Archives of Dermatology, 1880, Vol. VI. p. 257.

between a dislike to the restraints of school and the development of a lesion on the integument, but a careful study of the physiology and pathology of the skin will render it equally difficult to conceive the means by which a lesion of a definite form, with a regular and definite succession of phenomena, prolonged for several weeks, can be produced and uniformly maintained by any external agent whatever, and that agent in the hand of a school-girl. If such were the facts we must all bow to the exquisite tact of the accomplished artist." Wilson then traces out the pattern offered by the lesion and its development, and calls attention to the rarity of the production of any of the secondary products of inflammation.

To this I may add that, when we find precisely similar lesions occurring under the same circumstances in patients residing in France, Germany, England, and the United States, it is more reasonable to suppose them all due to a similar pathological process than to suppose that malingerers of varied nationalities should all follow the same pattern in their artificially induced lesions. Thus, Fortner[1] describes an hysterical young woman who showed lesions resembling a blister with the top rubbed off, of a long oval shape, a quarter of an inch in width by three-quarters of an inch in length, situated on the back of the right hand and wrist, and, later, over the insertion of the deltoid and about the mouth. He says the lesions were abnormal and resembled no known pathological process; they were considered factitious. Stelwagon[2] reports a case where somewhat similar lesions existed, and other cases are reported by Bronson,[3] Fagge,[4] Flower,[5] and other observers of various nationalities. In some of these the patients were found to have made irritating applications, in others they were supposed to have done so, and in still others the idea of simulation could be absolutely excluded.

The cases which I am about to describe resemble in many essential particulars those observed by Wilson. I do not, however, consider the title "neurotic excoriations" sufficiently exact to retain. The histories of my cases are as follows:

Case I.—Maggie T., eighteen years of age, came under my notice in October, 1885. Some portions of her early medical history are found in one of Weir Mitchell's works.[6] She is there noted as enjoying admirable health, but of a neurotic breed, there being in the immediate family two cases of infantile palsy. She came under the care of Drs. Stryker and Mitchell at an institution near Philadelphia, being one of a number of the girl inmates who were attacked by an epidemic of mimicked disease. Maggie led off with hysterical spasms, and a number of others were subsequently involved by way of mimicry of her attacks. After having recovered from these symptoms she remained well, and

[1] Lancet, August 25, 1883, p. 325.

[2] Archives of Dermatology, 1882, Vol. VIII. p. 236.

[3] Jour. Cutaneous and Gen.-Urinary Dis., June, 1890.

[4] British Med. Jour., 1870, Vol. I. p. 151.

[5] Ibid., 1870, Vol. I. p. 307.

[6] Lectures on Diseases of the Nervous System, especially in Women, Philadelphia, 1885, p. 75.

some five or six years later was a domestic in my family, where she developed the skin affection to be described.

My attention was called to certain "sores" which, it was said, had showed themselves on various parts of her body at different times, usually about the menstrual periods. A casual inspection of these lesions inclined me to consider them excoriations which had been caused by the application of some caustic fluid. They soon disappeared, but returned again at the next menstrual period, when I examined them more closely.

On this occasion three lesions were presented, all upon the right cheek. They were in the form of small excoriations or erosions upon a puffy and edematous base, the immediately surrounding surface being of a dusky pink or purplish color, smooth, and shining. A few days later the edematous appearance had disappeared, and the excoriations were on a level with the surrounding skin or sunken a little, and were covered with a crust of dried serum. Subsequent outbreaks were noted, usually coinciding with the menstrual periods, which occurred irregularly.

On one occasion small abrasions and shallow ulcers, from finger-nail size to ovals of one and a half by three centimetres, were observed on the back of the hand. Larger ones were said to be present upon the abdomen and in the groin, and one had appeared upon the side of the neck a week previously.

The patient's health was fair, but she was weak and languid and slept badly, tossing and moaning in her sleep, with occasional attacks of nightmare. At times she was extremely morose and sulky, and it was usually after having been in this mental condition for several days that a fresh crop of lesions would show themselves.

Under tonic and hygienic treatment the attacks grew gradually less frequent, and finally the lesions ceased to appear. The patient married in 1889, and has not since then had any return of the skin affection.

Case II.—Annie J., twenty-four years of age, came under my care at the Philadelphia Polyclinic in October, 1883. She had always been strong and well until four or five years ago, but since that time she had fallen off in flesh and strength and had become subject to attacks of fainting. She was a pale, nervous-looking girl, subject to flushing and showing signs of mild hysteria.

The skin affection for which she sought relief was of several weeks' standing, and was confined to the chest and mammary region. The lesions were about a dozen in number and presented themselves in various stages of evolution. The lesions were of an oval shape, about three centimetres in length and two centimetres in breadth. They presented the appearance of abrasions or of a surface which had been lightly cauterized. Some showed a flaccid bulla on the surface, others were moist in the centre and covered with a thin, grayish, pultaceous exudation. They were all surrounded by a pinkish areola. Some of the older lesions were covered with a crust of dried serum. The skin in the neighborhood of the patches, and indeed all over the region of the neck, was hyperesthetic, and the patient winced at the least touch.

By the patient's account, the lesions usually appeared during the night. The first thing noticed was a patch of redness on the skin. This was soon covered with a thin serous discharge oozing from the surface, which later dried into a crust, and fell off, leaving a faint brown stain. In some instances the serous discharge gave way to a superficial slough. In other cases the epidermis separated and a flaccid bulla was formed. In every instance the pinkish areola which was absent in the beginning showed itself when the lesion was at the height of its development. There were no scratch marks or signs of rubbing, nor of any application having been made.

The patient was under observation about six weeks, during which time six

successive outbreaks occurred, of one to three lesions at a time, at intervals of from five to ten days. The old lesions healed very rapidly, and the new ones came out just frequently enough to keep up the succession. The front of the chest and the shoulder were the only localities affected. She complained of pain in the right shoulder, and the skin of the chest continued hyperesthetic even after the lesions had healed.

Case III.—Wilhelmina S., nineteen years of age, was seen by me at the Pennsylvania Hospital in January, 1886. She was in the care of the late Dr. Hutchinson and of Dr. Da Costa, to whom I am indebted for the opportunity of studying the case.

Her history was that of a neurotic. A sister was in an insane asylum and she herself was markedly hysterical. She had enjoyed good health to the age of fourteen, when she began to menstruate, and about the same time the eruption for which she sought relief began to appear. She had ceased to menstruate about a year and a half previous to my examination, but no positive connection could be traced between the menstrual function and the skin eruption.

The affection appeared at first upon the face, and subsequently attacked other regions, chiefly the breasts and the extremities. A few lesions had appeared over the shoulders and the lumbar regions.

The patient said that the onset and appearance of the lesions were uniformly the same. A red patch first showed itself upon the skin, looking like a burn or scald; soon after a blister developed, which ran the usual course of such lesions and dried up, leaving a crust behind. The lesions came in crops; they were preceded and at first accompanied by burning pain, and the outbreak of a series was usually terminated by an attack of "erysipelas in the head."

On examination, the patient seemed of fair physique, well developed, and in good general condition. On looking at the skin of the face I was struck by its scarred condition. Both face and forehead were covered with numerous sharply defined but very shallow smooth cicatrices, of a squarish outline, and from half a centimetre to a centimetre in diameter. A deeply excavated cicatricial cavity at the edge of the external meatus of the ear on one side showed where a more serious lesion than those described by the patient had been seated.

Several lesions in a more or less active stage of development could be seen here and there. On the prominence of the left cheek could be seen a black eschar about two centimetres in diameter, of a squarish outline. On the right side of the neck, extending down over the anterior edge of the sterno-cleido-mastoid muscle, was an elongated patch resembling an excoriation, oval in shape, six or seven centimetres in length and about a centimetre and a half in breadth at its widest part, and covered with a thin crust of dried serum. Several similar excoriations, somewhat less distinctly marked, could be seen, in various stages of evolution, over the sternum, below the mammæ, and on the forearms.

I had an opportunity of seeing the patient several times at intervals of a week or more, and have only noted the occasional appearance of one or more excoriations at a time, now in one part of the surface and now in another. One lesion of a markedly bullous character formed on the ankle and was followed by an ecthymatous crust.

At the end of about a month the patient left the hospital, but returned after four days, giving the history of a fresh outbreak of the eruption the night before. The face alone was the seat of eruption in this attack. It was covered with numerous small bullæ seated upon an inflamed base, oval in form, from three to six millimetres in width by two or three centimetres in length. At the external meatus of the left ear was a large eschar, penetrating a little way into the meatus itself. Four days later only crusts were left to mark the remains of

the bullæ, while the eschar on the ear was beginning to separate, leaving a deep granulating ulcer. At this date the patient passed beyond my observation.

Case IV.—I am indebted to the kindness of Dr. Charles M. Ellis, of Easton, Md., for the notes of this case.

Katy B., seventeen years of age; no family history. She began to menstruate at fifteen, but has menstruated irregularly. She was brought up in a church home, and at the time of examination was a servant in a private family.

The first outbreak upon the skin occurred in the summer of 1889. She then showed numerous patches of disease on the face and on the arms. The lesions came out in successive outbreaks, and she was sick for two weeks. The second attack occurred in December of the same year, the face and forearms being involved, but with fewer lesions. The third attack occurred in the summer of 1890, but was confined to the face.

When seen by me, on March 4, 1891, the patient was suffering from a fourth attack, which had begun about five weeks previously. The eruption began by the appearance during the night of two patches of disease which showed themselves upon the right cheek. The lesions were oval or oblong in shape, about six centimetres in length by one and a half centimetres in width. The following morning two more patches appeared, one on the left cheek, the other under the left eye. On the third day a fifth patch appeared on the left cheek, and three more patches came out in succession within a few days. These last were situated on the left forearm.

At this time the eruption was confined to the cheeks, being uniform and bilateral. The most recent lesion was in the form of an irregular, reddish, slightly inflamed looking, and edematous patch. The inflammation was exceedingly superficial, and resembled a slight burn caused by the near approach of a hot body, or a light application of some caustic, as ammonia. There seemed to be a slight tendency to vesiculation. The older lesions looked like excoriations and showed numerous slightly bleeding points, but there was no sign of abrasion or scratching. The lesions were tolerably uniform in shape and size at this time, being of a squarish outline and about two centimetres in diameter. Stains of old lesions could be seen on the flexor surface of the forearms. These were oblong, with the long diameter coinciding with the line of the forearm, and were about three centimetres in length by one centimetre in breadth. There were, perhaps, eight to ten lesions of all stages of development present at the time of the examination.

Dr. Ellis, who had the opportunity to study the lesions throughout their evolution, told me that when a patch first appeared upon the face there was a blush, apparently deep in the skin. This roseate rash gradually deepened in tint, and by the expiration of twenty-four hours a very slight vesication could be seen with the aid of a lens. Gradually this vesiculation increased, some vesicles breaking with a very slight discharge. Then an apparent contraction occurred, with the formation of a scab and desquamation on the fourth or fifth day, leaving a transient brownish-red pigmentation.

Such was the appearance of the lesions on the face. Those on the forearm, or some of them at least, were somewhat different. When first seen the appearance was that of a brownish, slightly elevated patch, with little or no effort at vesiculation, but tending to go on at once to desquamation.

Dr. Ellis said that the first symptom felt by the patient was that of slight itching, which developed later into an intense burning sensation. The patient herself told me that the appearance of the lesions was preceded by a feeling of burning in the skin, so that she could predict the outbreak before any visible signs could be perceived.

Case V.—Dora ——, aged twenty-four, an old neurotic and hysterical case,

having been under Dr. Sinkler's care at the Orthopedic Hospital in former years, was also brought to my notice by the kindness of Dr. Ellis. She had always been sickly, and had commenced to menstruate at the age of eighteen, the menses being irregular with long intervals. Some time after the menses appeared the patient began to suffer with profuse sweating; she said that "pints" of sweat poured from her body.

When I saw her on May 19, 1893, she had been suffering for three or four months with an eruption chiefly confined to the lower limbs. The eruption was said to have showed itself first on the left foot, where blisters, quickly rubbing off into abrasions and followed by gangrene, appeared in succession, spreading slowly up the leg. At the same time the leg began to swell from below upward, the edema appearing at higher points *pari passu* with the upward extension of the eruption.

On examination the disease was found confined to the left foot and leg, which were markedly edematous and so swollen and heavy that the patient was obliged to use a crutch in walking. The flesh was firm to the touch, but gave a sensation of marked, almost icy coldness. The lowered temperature of the surface extended up to the middle of the thigh. The color of the edematous parts was purplish blue. From the instep to the knee the whole leg, excepting a band directly down the centre of the leg and calf behind, was covered by a series of abrasions and gangrenous patches. These patches were confined to the anterior and lateral portions of the leg, leaving the posterior aspect free. The patches were apparently abrasions of the skin, and looked as if the epidermis had been rubbed off with sand-paper or had separated after the application of a blister. They were markedly squarish in outline, and in one case a cross-barred arrangement of red lines like scratches could be seen. Some of the older patches were gangrenous; they had lost their squarish outline and were oval and covered with a grayish-black slough. The lesions were seated upon a swollen, hard, edematous limb, purplish in places, and, as has been said, cold to the touch.

The patient stated that the lesions first made their appearance like red blisters, accompanied by pain.

I have not seen this patient since the brief visit which I paid her with Dr. Ellis, and so cannot tell what was the termination of the case.

It will be observed that the cases just described coincide in their main features with those I have quoted from Wilson. In each case a feeling of burning or tingling, followed by an erythematous blush, ushers in the eruption. A slight serous effusion follows, sometimes merely loosening the cuticle, at other times giving rise to a bulla, either flaccid or tense according to the amount of serum poured out. The skin is sometimes rubbed or scratched at this stage, and the cuticle easily rubbing off leaves the derma exposed, the latter oozing serum or bleeding on the slightest touch in some cases. The lesions are frequently situated on a slightly puffy, edematous base and are surrounded by a dusky-pinkish areola.

The individual lesions run a rapid course, drying up and leaving a crust, which soon becomes detached, resulting in a brown pigmented spot; sometimes, as in Case V., the process seems to be one of greater intensity, and may leave superficial scars or even go on to gangrene and leave deeper scars. There is, in fact, no well-defined limit to the evolution of the process, although in the group of cases reported the erythematous character seems well defined and dominates the clinical picture.

On comparison of these cases with the similar ones referred to, it will be found that there are so many points of resemblance as to justify grouping them under one designation. That they are met with in hysterical conditions is obvious. That they are dermatoneuroses, and not factitious affections of the skin, seems to me certain from their uniformity and from their general resemblance to one type although occurring under so many different circumstances.

It is true that, in some cases, the admission of the patients that they have irritated or rubbed themselves seems to indicate a factitious origin, but such irritation has generally been practised after the preliminary symptoms have shown themselves. We often find that urticaria first shows itself after the patient has rubbed or scratched the skin; do we therefore conclude the eruption to be factitious? Moreover, in many of the cases observed the patient has not touched the part affected, and yet the lesion is precisely the same.

The theme of hysteria in its manifestations upon the skin is a large one. I have sketched an outline of the subject in the paper referred to at the commencement of this article, and I hope to fill in this sketch by the publication from time to time of studies upon these various manifestations, of which the present paper is the beginning. In the mean time, I beg the acceptance for this class of affections of the name "Dermatoneurosis erythematosum hystericus."

SURGICAL TREATMENT OF ACUTE RHEUMATIC ARTHRITIS.

BY JOHN O'CONOR, M.A., M.D.,
Senior Medical Officer, British Hospital, Buenos Ayres.

I FEEL diffident in calling attention to what may at first sight appear rather heroic treatment for acute rheumatism, and, before entering on such a delicate task, I think it right to state that I am fully cognizant of the enormous labors which have been bestowed on this malady by most competent medical scientists. But, as my own clinical observation has led me to differ from the many theories which have been promulgated, I wish briefly to ventilate my ideas on the subject, without presuming to criticise the views which others hold dear.

It is my opinion that acute rheumatism is primarily a joint affection, due to some morbid material conveyed by the blood; that this poison, be it germ, ptomaine, or ferment, gains admission to the human body through the tonsil or through one of the many doors open to such intruders; that the joint invasion is promptly followed by a form of acute arthritis, with

general toxemia, and, furthermore, that the infected joints serve as incubators, where the poison is elaborated and poured into the circulation, and by this latter agency is conveyed to other articulations and to the heart; and that in some cases the joints retain the virus in a latent form until some chill, etc., rouses it into activity. Holding such views, I feel it necessary to suggest that the term "acute infective arthritis" be substituted for "acute rheumatism;" the latter, in reality, is a vague expression with little or no etiological or pathological significance, and the prefixes "gonorrheal," "pyemic," "tubercular," "syphilitic," etc., may conveniently be retained in order to differentiate the arthritis peculiar to each.

The next thing to be done is to see if there are any other affections which are in any way analogous, and if so what treatment of them is most beneficial. Gonorrheal arthritis and pyemia resemble each other in many respects, and I find that the only successful treatment for a gonorrheal or pyemic joint is immediately to open, irrigate, and drain it. (As the last statement may possibly be questioned, I append four cases which I think will help to justify such a conclusion.)

It is unnecessary to occupy space in detailing the advantages which would accrue from a treatment of this horrible malady whereby its progress could be stopped and its cause possibly eliminated from the system. Medicine has done good service, but there are few of us who have not seen many desperate cases in which salicylates, alkalies, flannel, and everything else miserably failed, and furthermore I maintain that it is impossible to prognosticate in any given case, at its onset, whether the person will recover unscathed, be left with a damaged heart, or have an accumulation of virus left latent in the articulations, ready at any moment, on slight provocation, to flare up and endanger the life of the individual. Therefore I have no hesitation in suggesting that recourse should be had to surgery in order to see if it is possible more successfully to combat such a treacherous disease.

In the case about to be described, not only was surgery successful, but the result clearly proved that operation was delayed too long.

B. C., aged 41, clerk, was admitted to the British Hospital on June 21, 1897. Nine days ago, on leaving his office, he "caught a chill." Two hours later he had acute pain in the left elbow; this was soon followed by pains in both knees, with fever, shivering, sweating, and general malaise. He remained in bed, and two days later sent for a doctor, who diagnosed rheumatic fever, and prescribed sodium salicylate fifteen grains every three hours, flannel around the joints, magnesium sulphate, and fluid diet. His temperature was then 103.4° F., and the knee-joints were swollen, with considerable effusion. He had never had any serious illness, but had gonorrhea fifteen years ago. An alcoholic tendency.

On admission, patient presented a worn-out appearance, due, he said, to sleeplessness. His temperature was 102° F.; his tongue was thickly coated; pulse 80; continuous sweating; urine scanty, high colored, full of urates, with a trace of albumen; anorexia. There was slight pain in the left elbow, without swelling; both knee-joints were swollen and painful, patellæ floating, with some periarticular inflammation and slight edema. Heart and other organs normal. Diagnosis, rheumatic fever. He was given sodium salicylate fifteen grains every

three hours, the joints were enveloped in warm wool and flannel bandages, and he was placed between blankets and given milk diet.

A week later, as no improvement had taken place, salicin was tried, the only result being that the pulse fell to 56. On July 1st alkalies were substituted for the salicylates and warm fomentations were applied to the swollen knees. As the pulse was becoming very weak, strychnine was injected every six hours; also mistura vini Gallici, Brand's essence, coffee, and beef tea were ordered.

July 12.—No improvement; patient decidedly losing ground. Half-drachm doses of turpentine given every six hours.

July 14.—Condition worse; mistura quinini given every four hours.

July 16.—Pulse weak and compressible, fever continued; patient very emaciated, lay like a log in bed, lost all desire for nourishment; tongue foul; knee-joints more distended and painful, transitory twinges in left elbow. As he could not take food in sufficient quantity, nutrient enemas were ordered.

I now found myself placed in a very unenviable position, for I believed that surgery would save him, but I feared that the anesthetic might kill him. However, I decided that death on the operating-table was preferable to the slow torturing process. So, on July 17th, ether was administered, a two-inch incision was made into the right knee-joint, four ounces of greenish, turbid, flocculent serum, with many large masses of lymph, were removed, irrigation with 1 in 5000 biniodide lotion, and gauze drain inserted. Owing to his corpse-like aspect, the left knee was not opened. He was promptly removed to a warm bed and anti-shock treatment liberally applied.

On the following day the dressings were removed; drain soaked with serum; pain considerably diminished.

Third day, again dressed; joint quite dry; swelling had disappeared; no pain on palpation; drain left out.

Sixth day, joint normal in contour, wound healing aseptically in depth, patient felt greatly relieved "on that side."

Sixteenth day, wound healed; active movement through half a right angle without any pain; joint normal in appearance.

The day following operation, he complained more than ever of the pain and tension in the left knee. Poultices were applied without benefit; by the sixth day all the general symptoms were as marked as before, and it was evident that the only way to avoid a fatal termination was by operating at once.

July 24.—Arthrotomy; six ounces of greenish turbid serum and many large lymph flakes were removed; one of these masses was found becoming organized, numerous small blood-vessels having formed in it. The joint was irrigated and drained. Periarticular thickening and edema were very marked on this side, particularly in the popliteal space.

First day, temperature did not exceed 99° F.; pain ceased. An uneventful recovery followed. The joint rapidly resumed its normal contour, except the thickening in the popliteal space, which slowly disappeared. Fever did not return, pain ceased in the elbow, the tongue cleaned, appetite returned, sweating stopped, and he was allowed out of bed on August 10th, able to partake of full diet, cod-liver oil, and iron. For some time after this he complained of stiffness in the left popliteal space, caused by the thickening and edema around tendons. Convalescence was slow, owing to the intense prostration, but he rapidly gained flesh, and was discharged cured five weeks later.

The information derived from this case was (*a*) that arthrotomy had an immediate curative effect on the arthritis of the right knee; (*b*) that delay in operating on the left one allowed the inflammation and edema of

surrounding structures to assume a chronic form; (*c*) that this arthritis is amenable to surgical treatment; (*d*) that the general toxemia disappears once the infected joints are opened, the morbid material cleared away, and drainage provided; and (*e*) that no patient suffering from acute infective arthritis, however bad, should be permitted to die without giving him a surgical chance.

As no line of treatment is worth much without a plan, I wish to suggest a few working principles. Operate as soon as possible after the disease has declared itself (by causing swelling or effusion in a joint); do not wait for other joints or for the heart to confirm the diagnosis; if operation is to be curative, as in pyemia, the sooner done the better. When more than one joint is affected, operation should be at once undertaken, even if the heart has been already attacked. No good can come from allowing the infected joints to continue as incubators for the virus, for our object ought to be to save the endocardium from further destruction, to protect the non-infected joints, and, if possible, eliminate the poison from the system, as well as cure the infected joints themselves.

Acute Epiphysitis; Pyemia; Operation; Recovery.—A. S., aged five and a-half, entered the hospital on May 4, 1897. He was very healthy until the 23d of March last, when he suddenly complained of severe pain at the lower end of the tibia, accompanied by fever and shivering. On the following day his father observed some swelling in the same region, and immediately sought medical skill. Poultices were ordered, and kept going night and day until April 1st. Fever, rigors, and sweats continued; the swelling extended upward to the middle of the leg and downward into the ankle-joint. A small incision was made on each side of the tumefaction, and a teaspoonful of matter removed. Constitutional symptoms continued getting worse, and on April 10th a fluctuating swelling suddenly appeared on the chest, to the inner side of the right nipple. An incision was made into it, pus evacuated, and it healed. On April 14th pain was complained of in the right elbow; it rapidly became swollen, and poultices were applied to it until April 23d. A consultation was now held. Chloroform was administered, and an incision was made to the inner side of the olecranon; "nothing found;" also a five-inch incision was made in the site of the former cut over the tibia, but no purulent collection was encountered. The bone was found bare, and the operator drew the father's attention to the "hard ring caused by the probe touching the bone;" this the surgeon said was "a good sign." On April 25th some pus was seen exuding from the ankle and elbow. The father lost confidence in the local talent, and determined to run the risk of bringing his son some four hundred miles by train to the British Hospital.

Condition on Admission, May 4th.—Emaciated; tongue furred and dry; pulse 120, temperature 104°, respirations 30; clammy sweat; anorexia; intense pain complained of in the left leg and right elbow. The leg was enormously swollen from below the ankle to the knee (evidently the latter joint was not involved, as passive movement was permitted); two unhealthy pouting wounds were seen, covered with profuse pale granulations and bathed in pus. The whole leg looked like a mass of dirty brawn. The right elbow was swollen and fluctuating, with a nasty, suppurating, everted wound on the inner side.

Chloroform was at once administered, and I made an incision commencing at the insertion of the patellar ligament and ending in the ankle-joint. The whole tibia was found bare and necrosed; little or no pus was so far met with.

I then opened up the medullary cavity, and found a tube of pus extending from the ankle-joint to the upper epiphysis of the tibia; with a gouge the whole cavity was exposed and a large gutter made; the business was finished with a Volkmann's spoon; only a thin, narrow strip of the posterior border of the tibia remained. This enormous wound was swabbed with liniment of iodine and plugged with iodoform gauze. The ankle-joint was also opened up, scraped, swabbed with iodine, and packed with gauze.

The elbow was then attacked by an anterior and posterior incision. The joint was found full of pus. As no dead bone was felt, I resolved to make an attempt to save it. All visible pus was cleared out, the interior swabbed with iodine, irrigated with 1 in 1000 biniodide lotion, and a large drainage-tube inserted through the joint.

First day, elbow dressed; slight purulent discharge; temperature normal.

Third day, a sudden rise of temperature to 104° F.; sweats; elbow found more swollen and purulent; leg and ankle wounds healthy.

Sixth day, tongue again becoming dry; fever, rigors, and sweats continuing. Notwithstanding frequent irrigation, etc., amputation had to be performed on May 10th, through the middle third of the humerus. Suppuration followed in the stump and the flaps sloughed, necessitating the removal of another two inches of bone on June 8th. Union by first intention followed.

The leg and ankle wounds filled in aseptically, and he was discharged cured on June 21st, with good movement in the ankle-joint and the wound healed. All that remained of the leg wound was a healthy granulating surface, two inches in width and seven inches in length, level with the skin.

Six weeks later he was brought to the hospital for inspection. The wound looked excellent, and his father stated that the boy had gained seven kilograms in weight since the date of discharge. As far as could be judged by palpation, his tibia had reformed.

Gonorrheal Arthritis; Operation; Recovery.—S. A., cattleman, aged thirty-four, was admitted to the hospital on March 20, 1897. In 1882 he suffered from gonorrhea, with accompanying arthritis of both knee-joints; he was unable to walk for some months. In 1894 he was once more infected by the gonococcus; both knees were again attacked, and this time "he was crippled for eighteen months." On February 28, 1897, he received a third infection. Ten days later his left knee became painful, swollen, and stiff; he also had occasional pains in the left shoulder. As his knee was gradually getting worse, he entered the hospital.

On admission, he suffered from a profuse gonorrhea, with transitory pain in the left shoulder. The left knee was found distended, painful, and partially flexed; the slightest attempt at movement caused him excruciating agony; the patella was floating; the circumference of the joint was one and one-half inches more than that of its fellow. General condition normal.

Gonorrheal arthritis having been diagnosticated, the joint was first blistered, then put up in a Scott's dressing, and lastly the limb was placed in a long Macintyre splint. Potassium iodide and santal oil were given internally, and urethral injections of zinc chloride administered every four hours.

Three days later he complained very much of pain. The Scott's dressing and splint were removed for inspection, and, as the condition was found in no way improved, arthrotomy was performed on March 24th; about four ounces of greenish flocculent serum were removed; on digital examination, numerous large flakes of lymph were detached by the finger and removed by irrigation with 1 in 5000 biniodide lotion, and a gauze drain was inserted. Pain immediately ceased; no constitutional symptoms followed. Primary dressing was

removed on the third day. Joint quite dry, painless to touch, and normal in contour. Drain dispensed with.

On March 30th the wound was healing in depth; he painlessly flexed his knee through a right angle. On April 10th full range of movement was restored; joint normal; patient allowed out of bed.

A few days later he developed a sharp attack of dysentery, which confined him to bed until May 4th. As the gonorrhea still continued, he was kept in the hospital until May 21st, when he was discharged completely cured of his various troubles.

Gonorrheal Arthritis; Operation; Recovery.—C. N., aged thirty, contracted gonorrhea eight months prior to admission, and, as no proper treatment was adopted, the discharge continued all this time. On March 14th he complained of pain in the right knee, and two days later the joint became swollen and stiff. He was admitted to the hospital on March 19th suffering from a purulent urethral discharge, with right knee-joint painful and swollen; patella floating; the leg was slightly flexed, and movement was impossible owing to pain caused on attempting it. Aspiration was performed and two ounces of greenish turbid serum were removed. Blisters and Scott's dressing with splint were afterwards applied, and the same medication adopted as in the previous case.

April 11.—Little or no swelling visible, but the joint remained stiff. Massage twice a day was ordered. Gonorrhea ceased.

June 1.—Movement slowly returning; walked with a decided limp. He was sent to Convalescent Home, and told to massage the knee every day. Syrup of iodide of iron was given internally. Three days later he was sent back to the hospital because the pain had returned and the joint had become slightly swollen. On re-admission some thickening was observed to the outer side of the patella.

June 13.—Arthrotomy; one ounce of serum, mixed with synovial fluid, evacuated, and a piece of thickened synovial membrane snipped with scissors and removed; irrigation, and gauze drain inserted.

June 16.—Dressed; joint quite dry, and normal in contour.

June 23.—Splint removed; active movement through a right angle.

June 26.—Allowed out of bed; walked with a slight limp, active movement increased.

July 12.—Discharged cured, with normal range of motion, no stiffness, pain, or swelling.

July 30.—Reported that knee was "strong as ever."

Gonorrheal Arthritis; Operation; Recovery.—A. R., aged twenty-seven, clerk, admitted on July 21, 1897. He had two previous attacks of gonorrhea, one in 1892 and the other in 1894. On July 1st he acquired the disease for a third time, and tried to cure it by remaining in bed for a week. The day after getting up he felt pain in the left knee; two days later the joint became swollen and slightly stiff. As these symptoms became more aggravated and gonorrhea reappeared, he entered the hospital on above date.

On admission, the right knee was found greatly distended with fluid, slightly flexed, muscles very rigid; little or no pain, except when movement was attempted; profuse gonorrhea was present. Blisters, Scott's dressing, and splint were applied, potassium iodide and santal oil given internally, and urethral injections ordered every four hours.

July 25.—No diminution in swelling or rigidity.

July 26.—Arthrotomy; five ounces of serum evacuated; irrigation and drainage as in the other cases.

July 29.—Dressed. Joint normal in contour; active motion through half a right angle.

July 31.—Drain left out.

August 3.—Allowed out of bed; active movement through a right angle.

August 13.—Normal movement restored; could walk and run without a limp.

August 14.—Discharged cured.

In conclusion, I wish to mention a few details in the method of operation. The incision must be large enough to admit the index finger, for lymph coagula fasten in the recesses of joints, and I have frequently noted that nothing short of digital shifting suffices to detach them. It is needless to say that if such plastic stuff should be left behind the operation would be robbed of half its value.

Irrigation should always be carried out; without it the toilet of the joint would be incomplete; my favorite injection being biniodide of mercury lotion 1 in 5000. Care must be taken to leave the joint cavity dry: nothing effects this better than a long roll of gauze; this can be packed in in all directions, twisted about, and when removed many flocculi will be seen attached to it. Last, but by no means least, drainage must be provided for. My experience has taught me not to open a joint, for any form of effusion, unless I am prepared to drain it; the rest and relief of tension afforded by a few strands of gauze are absolutely necessary in order to insure a good result.

It may not be considered extraneous to the subject of this paper if I mention that in our most recent text-books of surgery gonorrheal arthritis is described as "a disease that commonly ends by stiffening the joints" (Treves); "the disease terminates in resolution, in ankylosis, or in destruction of the joint, most frequently by far in ankylosis (fibrous), either partial or complete, due to organization of the plastic exudation, both articular and periarticular" (Keen and White); and furthermore, "unfortunately, there is no remedy yet known that can be relied on" (Treves).

I am not surprised that the recognized indolent treatment of this affection gives such bad results, for it is absurd to suppose that blistering or rubbing can cure an infective arthritis. The fact of the matter is this: when we meet with a collection of staphylococci we rush to operate, but when we encounter a collection of gonococci or rheumacocci we nostrumize, because we entertain some fears of merely opening and draining a non-purulent joint. If the germ pill is worth swallowing, we had better not bite at it, but rather become consistent, by adopting some general surgical principle on which to treat germs, their products, and their fluids.

VACCINATION.

BY FREDERICK A. PAULIG, M.D.,
Berlin.

INASMUCH as pathology still fails to give a rational explanation for the Jennerian empiricism, it is no wonder that its beneficent effects are still doubted, by the wise as well as the ignorant, in spite of overwhelming statistical proofs. The remarkable exclusiveness of German professional medicine necessarily created a scientific laity, so that vigorous and well-founded attacks upon the caste of medical men are an every-day occurrence. Thus, when vaccination in infancy and re-vaccination at twelve years of age were made compulsory, a powerful popular reaction took place, with the only effect, however, to besiege the authorities with voluminous protests against such measures.

In 1884 an official commission, recognizing the sad facts of the transmission of erisypelas and syphilis by vaccination, recommended the use of animal lymph instead of the human virus. Still deaths and accidents continued, until Dr. Landmann, at the sixty-seventh Congress of Natural Scientists (Lübeck, 1895), declared that all these pathological incidents were due to a decay or a septic degeneration of the vaccine virus, whether of human or animal origin. What a storm of popular indignation! Petitions poured in upon the officials, until, upon inquiry in the Prussian Diet, a body of experts was appointed for a detailed investigation of this question. With genuine Prussian thoroughness, this commission, consisting of Professors Koch, Pfeiffer, and Frosch, besides the superintendents of the great vaccine farms at Stettin, Berlin, and Cologne—Drs. Freyer, Schulz, and Panselow—considered the following objects:

1. To produce a vaccine absolutely protective and free from bacteria.
2. To establish the cause of the frequent septic (or other) infection occurring in vaccination.
3. To explain scientifically the empiricism of vaccination and its power of giving immunity against small-pox.

This comprehensive task, given to undoubted experts, was practically fulfilled by the report of Dr. Schmidtmann to the Prussian diet in March, 1896, but, however satisfactory this may appear to the critical layman, a complete illustration of this important hygienic investigation was necessary to quiet the prevalent scepticism.

Now Dr. Frosch, one of the members of the commission, has published the experience gained from the labors of his eminent colleagues in a report comprising eight chapters.

Concerning the number and species of bacteria found in vaccine lymph, it was observed that the microbes contained therein are destroyed by glycerin or age; also that there exist colonies of saprophytes on the skin of the

vaccinated individual. In a few instances the staphylococci found did not show the virulence of those causing septic inflammation, as in erysipelas, gangrene, etc.

The chapter on the method to improve vaccination, especially to diminish or destroy its supposed infectious character, is very interesting. To avoid a virus composed of blood and its components, the Berlin Institute uses the "bloodless lymph." This is obtained by strong pressure with a curette upon the circumscribed spot from which the virus is taken, so that, macroscopically at least, it remains bloodless. Finally, filtration and centrifugal separation, as practised by Schulz, were used to secure a clear water-like fluid. By improving upon this procedure through its repetition and an increase of the centrifugal power, a perfectly aseptic vaccinating material may be obtained. However, the results with this virus proved very disappointing: besides its failure to produce a normal reaction, the inflammatory symptoms continued to appear. Instead of glycerin, used heretofore as a disinfectant, experiments with ozone were made, which yielded absolutely negative results.

Recognizing the impossibility of artificial sterilization, attempts were made to create an aseptic soil for the development of the virus by a thorough antiseptic treatment of the heifer chosen to furnish the lymph. The result seemed encouraging, as even energetic antiseptics applied locally did not disturb the formation of normal vaccine, while the number of bacteria showed a considerable decrease. Complete sterility, however, could not be obtained.

Dr. Freyer made the discovery that the blood and also the substance of the different organs, as liver, spleen, bone-marrow, etc., contained the active principle of vaccine; numerous inoculations with such matter produced a typical reaction. This shows that the essence of vaccine circulates freely in the organism at a certain stage of the pathological process—about three or four weeks after inoculation. Now, as this substance, taken indiscriminately from the blood and organs of vaccinated animals, in spite of its established sterility produced, when inoculated into another animal, pustules containing micro-organisms similar in quantity and character to those of common vaccine, it is evident that all the pathological phenomena complicating the process of vaccination arise from causes independent of the quality of the virus.

Another interesting fact is that, contrary to the prevailing opinion, fresh pustules are sterile until the seventh day, as Dr. Pfeiffer demonstrated by many careful examinations. Bacterial infection of the pustules takes place when through the softened tissues saprophytic elements gain entrance.

Finally, Dr. Koch, as chairman of the commission, took especial care to submit all cases showing virulent inflammatory (pseudo-erysipelatous) conditions to a strict bacteriological examination, comparing the results with those of cases offering a normal reaction. The outcome was simply astonishing, as nearly nine-tenths of the former cases proved to be abso-

lutely free from bacteria, while of the latter every third case showed the presence of micro-organisms, including the *Staphylococcus erysipelatis*.

Having thus furnished positive proofs of the harmlessness of animal virus, the commission entered upon the task of finding the cause of the inflammatory diseases in connection with the process of vaccination. Dr. Freyer inoculated several babies on one arm with sterilized lymph, on the other with vaccine swarming with bacteria. A difference in the picture of reaction on the arms of the individual child corresponding to the suspected pathogenetic difference in the virus was not noticeable. Furthermore, while some children showed an intense inflammation on both arms, others remained normal. *Therefore, the reaction upon vaccination is absolutely individual.*

Koch, comparing the types of variola and vaccine pustules, came to the conclusion that the virus in general use is too condensed, and the problem arose how to produce a correct dilution. Numerous experiments favored a tenfold to twentyfold dilution which at the same time preserved its prophylactic properties.

Finally, great importance is attached to the technique of vaccination, a complete separation of the different pustules being especially necessary, so that the single small inflammatory processes cannot through confluence create a large area of inflammation. Therefore a distance of more than one inch is required between the points of inoculation.

Résumé.—1. The unwelcome inflammatory phenomena appearing in the course of vaccination depend upon (*a*) the individuality of the person inoculated, (*b*) the concentration of the lymph (*i. e.*, its active principle), and (*c*) the technique.

2. A causal relation between the micro-organisms commonly found in vaccine and the erysipelatous or other inflammations does not exist.

3. These diseases are caused by negligence on the part of the vaccinating physician or of the inoculated individual, and consequently may be avoided.

However grateful the science of medicine should be for these elaborate investigations, the chief question still remains without answer—What is the *rationale* of vaccination? As soon as science gives a definite explanation, all opposition to this most beneficent prophylactic procedure will cease.

REVIEW OF MEDICINE.

MEDICINE.

The International Lepra Conference. (*Medical News*, November 6, 1897.) Special correspondence.

At this conference, which closed at Berlin, October 16, the reading of papers was not allowed; instead, communications were received and printed before the meeting and were placed in the hands of the members in a volume of preliminary transactions. As a result, the sessions were well attended, and lively discussions took the place of the usual dreary reading of long essays. There was practical unanimity as to the specificity of the bacillus of Hansen. Some startling facts were reported as to the number of bacilli given off by lepers. Sticker, of Giessen, had observed an abundance of the bacilli in the nasal secretion of 140 out of 153 lepers examined; they occurred sometimes even where there did not seem to be any leprous lesions in the nose. Weber, of Halle, had found an enormous number of bacilli in scales scraped from the skin, many of which were about ready to drop off; he had detected them in the sweat, the saliva, the tears, and the hair. At Neisser's clinic Schäffer had calculated that a leper gave off 150,000 bacilli per hour. A cover-glass held before a patient while he read aloud was covered with bacilli, and they reached a distance of a metre and a half from the leper. Thorough antisepsis of the mucous membranes with mercury bichloride and silver nitrate did not cause them to disappear completely, though it greatly lessened their number. Petersen and Jeanselme considered the nasal secretion diagnostic in most cases, often at an early stage of the disease. Professor Virchow believes that mutilations seen in certain figures on pre-Columbian pottery point to the existence of leprosy on the American continent before the Spanish discoveries. Though Unna insisted that lepra bacilli are never intracellular, specimens were exhibited which seemed to prove that the bacillus may be intra- as well as extracellular. Nearly all agreed that heredity counts for nothing in the spread of the disease. The decision of the Royal College of Physicians of London, thirty years ago, that lepra is not contagious, was completely reversed, though there were a few non-contagionists from the East, who believe the disease to be hereditary. Emigration is undoubtedly the usual method of extension of lepra. As to serum-therapy there was very little said that was encouraging. Beisner has effected cures with chaulmoogra oil combined with electrolysis of the tuberculous lepra patches. The general opinion seemed to be that some combination of iodine and mercury used intermittently constitutes the best treatment. All agreed that isolation, as in Norway, is the ideal means to eradicate the disease.

CATTELL.

On Tuberculosis of the Lymph-Channels. (*Beiträge zur klin. Chirurgie*, Vol. XIX., No. 1, 1897.) By Professor Dr. Jordan.

Of the four principal portals of infection mentioned by Weigert the lymphatic system is perhaps the most open to attack. The frequency of tuberculosis of the lymphatic glands is, however, in sharp contrast to the rarity of infection of the channels themselves. The author reports four cases of the latter affection and also reviews the literature of the subject. He arrives at the following conclusions: 1. Tuberculous lymphangitis of the extremities more frequently attacks the arms than the legs. 2. The ages of the patients varied from five to sixty-five years, the majority being under thirty years. 3. Heredity was usually absent, existing in only five cases. 4. Both sexes are about equally predisposed. 5. In seventeen cases a tuberculous ulcer of the skin was the primary and the only source of infection of the lymph-channels (primary form); in six cases ulceration of the skin, in consequence of fistulæ due to tuberculous bone-disease, constituted the point of infection of the lymph-channels (secondary form). 6. The focus of infection in the primary form was always a tuberculous infection of the skin of the hands or feet. In three cases the patients had washed the clothes of tuberculous subjects; in four cases the patients were butchers, and were probably infected by tuberculous animals (Perlsucht); four cases of the secondary form were due to ulceration and infection of the skin around fistulous openings of the tubercular bone-disease. Jordan believes that the disease is not as rare as is commonly supposed, but that it is not recognized, partly because its demonstration is possible only in the subcutaneous lymphatics. Primary tuberculous lymphangitis always requires a peripheral skin affection (lupus, tuberculous ulcer, infection from the cadaver). Tuberculous affections of the skin of the extremities are rather rare; according to Hahns, there were only 105 cases among 424 cases of lupus. Kuettner reports only 25 cases occurring in the surgical clinic at Tübingen during forty years. Reasoning from the comparative rarity of lymphangitis of the extremities in other suppurative conditions, the author believes that a peculiar predisposition to this affection is necessary.

MUEHLECK.

The Relation of Rheumatoid Arthritis to Diseases of the Nervous System, Tuberculosis, and Rheumatism. (*Daily Journal of the British Medical Association*, September 2, 1897.)

Dr. James Stewart, who opened the discussion on this interesting subject, believes, from a study of forty cases in the last three and a half years, that rheumatoid arthritis is a disease prone to occur in people of a rheumatic tendency and who have suffered from subacute rheumatic attacks. The presence of infectious diseases of any kind tends to increase this tendency, as does the operation of all causes having a depressing influence on the resisting power of the nervous system (worry, exposure to cold, traumatism). There is no sharp dividing line between certain cases of

chronic rheumatism and the earlier stages of rheumatoid arthritis. There is not sufficient evidence to support the views commonly held as to the nervous origin of rheumatoid arthritis. There is no direct relationship between tuberculosis and rheumatoid arthritis. The polyarticular forms of rheumatoid arthritis have clinically the features of an infectious disease. The results of recent investigations point very strongly to its infectious nature. The most successful method of treatment in these cases is by baths of various kinds. In the discussion which followed, Dr. Shingleton Smith (Bristol) claimed that the disease was not a rheumatism but an arthritis, and that it was due to some infective agent. Dr. Lindsay (Belfast) claimed a relationship between rheumatoid arthritis and nervous disease, and thought that there was a close connection between rheumatoid arthritis and chronic articular rheumatism. Dr. Osler (Baltimore) drew attention to the presence of trophic changes in rheumatoid arthritis, *e. g.*, onychia. Dr. Jacobi (New York) supported the views of Dr. Osler, but asked Dr. Stewart to define rheumatoid arthritis. Dr. J. C. Wilson (Philadelphia) noted the fact that in rheumatoid arthritis there were frequent attacks of acute arthritis, but unlike rheumatic fever these left the joint damaged.

CATTELL.

On the Absorption of Fat from Clysters. (*Deutsch. Archiv f. klin. Med.*, Vol. LVIII., Nos. 2 and 3.) By P. Deucher, M.D., of Bern.

Patients were given nourishment containing a known small quantity of fat for four days, and the amount of the fat absorbed during this time was determined by fat-analyses of the feces. In a second period of from four to nine days the patients received the same food by the mouth and in addition were given fat-containing enemata of known constitution. Fat-analyses of the feces were made again during this period, and the amount of fat absorbed from the enemata was approximately determined, deducting the amount absorbed in the first period from that absorbed in the second period. His results were, in short, as follows: Only moderate quantities of fats are absorbed from the clysters. Even when all the favorable conditions are present and all precautions adopted, not more than twenty grammes will be absorbed from one enema and not more than ten grammes in one day. The urea excretion was greater in all the periods in which clysters were given, so that the fat absorbed from the enemata did not decrease the loss in albuminous bodies by metabolism. The enemata are most gratefully received by the intestine, and are best absorbed if, in addition to being in emulsion, warmed to 38° or 40° C., and introduced into the empty bowel, the dose of fat be moderate and the enemata infrequent, so that each one may have a long time for absorption. A .6 per cent. salt solution added to the enema aids in its absorption.

EDSALL.

THERAPEUTICS.

Phenomena of Mescal Intoxication. (*Lancet*, June 5, 1897.) By Havelock Ellis.

Prentiss and Morgan[1] and S. Weir Mitchell[2] have investigated the extraordinary vision-producing properties and therapeutic effects of mescal buttons, the fruit of the *Anhalonium Lewinii*, which is used in connection with the religious ceremonials of some of the Indians of New Mexico. Ellis made an infusion by pouring boiling water twice on three mescal buttons, cut into small fragments, and took it in three doses one hour apart. The first result noted was that a headache, which had been present some hours with a tendency to aggravation, was speedily dissipated. Before the third dose was taken there was slight drowsiness, which quickly passed off, giving place to a brief feeling of unusual brightness and energy. There was a certain heightening of muscular irritability, and within half an hour after taking the last dose the pulse had fallen to 48. One hour later symptoms of muscular incoördination began to appear, with slight faintness and nausea, but without marked discomfort. Within another hour visions were seen with closed eyes—confused masses of kaleidoscopic character—and distinct violet and faint green shadows were seen with the eyes open. A little later the color visions with closed eyes became vivid and distinct and the air seemed filled with vague perfume. Meanwhile the pulse gradually rose to normal, and muscular incoördination increased until writing, even with a pencil, became almost impossible. The paper written on seemed to have a golden hue, while the writing hand seen indirectly looked bronzed, scaled, and flushed with red. Unlike the experience of Dr. Weir Mitchell, who was unable to see the visions with open eyes in the darkest room, Ellis could easily see them with open eyes in a dark room, though they were less brilliant than when the eyes were closed. On going to bed the nausea completely disappeared, but no drowsiness was felt. This insomnia seemed due less to the constantly shifting visions, which were always beautiful, than to thoracic oppression and auditory hyperesthesia. The writer was uncomfortably receptive to sounds of every kind, and later there was ringing in the ear. The knee-jerk was much exaggerated and there was slight twitching in the larger muscles of the legs. The skin was hot and dry. Some hours later, as the visions were still seen, the writer lighted the gas, and then observed a series of vivid phenomena not alluded to by previous investigators. The gas seemed to burn with great brilliancy, sending out waves of light, which extended and contracted rhythmically in a greatly exaggerated manner, while shadows came in all directions, heightened by flushes of red, green, and especially violet. These predominantly violet shadows are probably to some extent conditioned by dilatation of the pupils, which, as the American observers had already noted, always

[1] Therapeutic Gazette, September 16, 1895.
[2] Brit. Med. Jour., December 5, 1896.

occurs in mescal intoxication. By 3.30 A.M. the phenomena had distinctly decreased, and the writer soon fell into a peaceful and dreamless sleep, from which he rose at the usual time, without any sense of fatigue, though faint visual phenomena persisted for a few hours. The only unpleasant symptoms experienced were the motor incoördination and the cardiac and respiratory depression. The visions when recalled to memory seemed as beautiful as when experienced. The phenomena seem to be due to general disintegration and exhaustion of the sensory apparatus; the same phenomena, even the color vision, are found to some extent in neurasthenia. The writer believes that all the senses were affected. There were vague dermal sensations, and casual stimulation of the skin produced other sensory phenomena—a heightening of the visions or an impression of sound.

CATTELL.

Treatment of Cancer by Injections of Pure Yeast. (*Journal de Médecine de Paris*, abstracted in the *Gazette médicale de Liége*, July 1, 1897.) By Dr. de Backer, of Paris.

The observations of de Backer cover one hundred cases, some of them recurrent, and all the patients are said to have been cured or benefited by the treatment. An injection of one cubic centimetre of pure yeast is made in the neighborhood of the cancerous tumor; this injection is repeated two, three, or four (rarely more) times at intervals of ten days. An amelioration is seen at once, both in the general health and in the local condition. In cases thus treated by the writer four years ago there has been no return of the disease. No untoward effects have been noted except when impure commercial yeasts have been used. The action of the ferment is explained on the theory that the neoplasm contains glycogen, the amount of which depends upon the rapidity of growth of the tumor. The glycogen, which is essential to the further development of the cancer, is destroyed by means of fermentation therein set up by the yeast, with the result that the growth of the neoplasm is retarded or arrested. This favorable result is believed to be aided by the final production of alcohol in the nascent state and by an abundant leucocytosis which always follow the injections.

CATTELL.

Formaldehyde as a Disinfectant. (*New York Medical Journal*, October 16, 1897.) By Alvah H. Doty, M.D., Health Officer of the Port of New York.

Formaldehyde: Its Chemistry in Disinfection. (*Ibid.*) By Ernst J. Lederle, Ph.D., Consulting Chemist to the Health Officers' Department, New York.

After referring to the general substitution of steam for sulphur dioxide (SO_2) as a disinfectant during the last few years, despite the fact that steam cannot be used for the disinfection of dwellings and of certain fabrics, Dr. Doty describes the processes employed for generating formalde-

hyde gas and the tests which have been made therewith at the New York Quarantine Station during the last twelve months. The micro-organisms of cholera, anthrax, diphtheria, and the plague were exposed to the gas not only directly, but also when wrapped closely in blankets, newspapers, and sealed packages. The virulence of the germs was kept at the highest point by inoculations of guinea-pigs and white mice, and controls were made in each experiment. The tests were conducted in the steam chamber and in the steel formaldehyde tank on the disinfecting steamer, also in a room, almost perfectly tight, of a thousand cubic feet capacity, made expressly for this purpose. The gas was derived from (1) commercial formalin (formol), a clear, colorless fluid, said to be a forty-per-cent. solution of formaldehyde gas in water; (2) the combination of formalin and calcium chloride in a closed receptacle; (3) the oxidation of methyl alcohol with a specially devised lamp; (4) the heating of tablets of paraformaldehyde (paraform). When eight ounces of formalin were exposed in a large shallow pan placed on the floor of a tightly closed room for twelve hours, or even six hours, superficial disinfection was complete; with only four ounces of the solution disinfection was not complete. When linen disks soaked in the cultures were tightly wrapped in newspapers, blankets, or towels and placed in an air-tight chamber, from which the air was then withdrawn and formalin conducted into the apartment through a small pipe from above, disinfection was more reliable than without the vacuum, which evidently aided the penetration of the gas. Better results were obtained, and much more economically, by (2) heating together formalin and a ten-to-thirty-per-cent. solution of calcium chloride in a closed receptacle or autoclave. The gas contained in the mixture is rapidly given off in a comparatively dry state (if the temperature does not exceed 135° C.), and can be conveyed by a slender tube (one-sixteenth of an inch lumen) wherever it may be wanted, even through a keyhole or other small opening. It was found that two ounces of formalin in the mixture placed in the autoclave were sufficient for superficial disinfection with an exposure of twelve hours in an air-tight chamber of two hundred and fifty cubic feet capacity. With the help of the vacuum the results would be doubly certain. With a pint of formalin in the mixture letters and other mail can be disinfected in four hours. (3) With lamps of special design formaldehyde gas may be cheaply obtained by the oxidation of methyl or wood alcohol. The lamp suggested by Professor F. C. Robinson is simple, effective, and quite satisfactory for use in houses, but the process is slow and the lamp must remain in the apartment until disinfection is completed. (4) The heating of paraformaldehyde tablets is a simple, neat, and efficient, though expensive, method of obtaining the gas. In this process also the gas is evolved slowly and the lamp for heating the pastilles must remain in the room, where it cannot be kept under observation. Hence for general use, particularly for ship disinfection, the author prefers the autoclave (2), which, being outside the apartment undergoing disinfection, can

be easily regulated and can be removed as soon as the gas has been driven off. As the result of his numerous and evidently very thorough tests, Dr. Doty concludes that formaldehyde cannot be trusted as a disinfectant where deep penetration is required, but that it can be relied upon to penetrate letters and other thin packages placed in an air-tight chamber, especially if the air be exhausted therefrom. That such packages are usually penetrated in a comparatively tight room is proved not only by the germicidal effects of the gas, but also by its action on blotting-paper and silk covered with fuchsin or magenta, placed inside of letters, inclosed in envelopes and tightly sealed; the change of color is very apparent after treatment. The action of the gas on infected disks placed inside of blankets, etc., is uncertain and variable, but for hangings, furniture, clothing, furs, and other articles which can be fully exposed, formaldehyde is a disinfectant of the highest value, which does not, as a rule, injure the finest fabrics.

Chemically formaldehyde is, as shown by Dr. Lederle, an oxidation product of methane or marsh gas (CH_4). The substitution of one hydrogen atom by an hydroxyl radical produces methyl alcohol (CH_3OH), which on oxidation becomes formaldehyde (CH_2O+H_2O); by still further oxidation formic acid and carbonic acid result. Formaldehyde is a colorless gas, with a strong odor, and extremely irritating to the eyes and nostrils. It has powerful chemical affinities. It combines readily with ammonia, forming hexamethylentetramine, which is odorless; hence formaldehyde is very valuable as a deodorizer. This reaction is also useful in testing the strength of the solutions purchased, which vary greatly in their content of formaldehyde. In 1891 A. Trillat showed that it possesses antiseptic properties much superior to any other non-toxic antiseptic then known. Flies and other insects are not affected by it, and animals have lived for hours in rooms charged with its vapor. Though weak solutions have been taken internally without injury, its general use in foods should not be permitted, as it interferes with digestion. Some of the solutions purchased were found to contain methyl alcohol in such proportions as to cause them to burn when touched with a lighted match. Such samples should be used only with great care, on account of the danger of the explosion of the vapor.

CATTELL.

A Spice Poultice.

Dr. G. D. Hersey gives in *Nursing World* the following directions for making a spice poultice: Take one teaspoonful each of mustard, ginger, black pepper, cinnamon, cloves, nutmeg, allspice (or as many of them as you may find) and mix them dry; unless this is done the mustard will lump when hot water is added. Having mixed the dry powdered spices, add boiling water, little by little, with constant stirring, until the mass is of the consistency of soft putty. Too much water will cause the poultice to run through the meshes of the cloth; too little leaves the poultice so dry that it fails to hold together and the spices soon separate and rattle out. After

thorough mixing put the poultice, steaming hot, into the middle of a thin handkerchief or similar square piece of cloth and spread out the fragrant mass to about the size of your open hand; fold over it one side of the cloth, then the other side, and finally the two ends. It is now ready for use, and may be left in place all night without danger of blistering. The efficacy of this soothing poultice depends on the essential oils in the spices, and these are brought out only by using scalding water. Cold or lukewarm water fails utterly to bring out the peculiar anodyne quality of a spice poultice.

CATTELL.

The New Local Anesthetic, Holocain. (*Boston Med. and Surg. Jour.*, June 3, 1897.) By Hasket Derby, M.D., of Boston.

In the January number of his *Centralblatt*, Prof. Hirschberg announced a new local anesthetic, which he first named amidin, but which is now called holocain. He found its anesthetic effects on the eyeball prompt and entire, and that no local irritation followed its use in extracting a traumatic cataract and in about forty-five other cases. The one per cent. solution needs no sterilization, being itself bactericidal. Though strongly poisonous, acting thus in one-fifth the strength of cocaine, no injurious effects have followed its instillation into the conjunctiva, and it will probably supplant cocaine in many cases of ophthalmic surgery. Among its advantages are these: (1) it does not enlarge the pupil, (2) nor affect the accommodation, (3) nor increase intra-ocular pressure, and (4) it promotes antisepsis, and (5) may be used when cocaine is contra-indicated. Its poisonous nature, however, prevents its use subcutaneously, and, as it does not contract the vessels, operations done under its influence are likely to be attended by more bleeding than those performed under cocaine. Drs. Heinz and Schlösser (*Klin. Monatsblätter*, April, 1897), who have used holocain four months, find that one or two drops of a one per cent. solution produce analgesia in from forty to fifty seconds. A second application, forty seconds later, causes full corneal anesthesia in thirty seconds more. When first instilled it induces some burning sensations and slight conjunctival injection, which, however, soon pass away. The anesthesia lasts at least ten minutes. After opening of the anterior chamber a second application was found to affect both iris and ciliary body, an iridectomy for acute iritis causing no pain.

CATTELL.

The Chloride of Sodium Treatment of Tinea Tonsurans and Tinea Circinata. (*British Medical Journal*, September 25, 1897.) By Charles E. Murphy, L.R.C.P.

All scabs having been removed by soaking with olive oil or poulticing, the diseased area is well rubbed once or, better, twice a day with a saturated solution of common salt on a small sponge. It is a clean and painless application, but yields its best results when the whole treatment is given by the medical man himself. Cure resulted, on an average, in sixteen days.

CATTELL.

Serum Antipesteux Treatment of Epidemic Plague contrasted with Ordinary Methods. (*Birmingham Medical Review*, September, 1897.) By N. Dempster Mason, in medical charge of Plague Hospital, Cutch Mandvi.

From personal observation of over twelve hundred cases in hospital and many outside, the writer has no doubt that the plague is communicated by the sick to the healthy, especially where free intercourse between them exists. That persons brought into only occasional contact with the disease are much less liable to be infected is shown by the fact that only two cases occurred in a large staff of doctors, nurses, and attendants at the various hospitals. The contagion may be conveyed by (1) the air, (2) food or drink, (3) the skin, or (4) the tonsils. The third method is especially common in cases affected with buboes. Most of these glandular swellings are found in the groin, as would be expected among a bare-footed people, any abrasion of the skin of the feet affording entrance to the bacillus. There is some evidence of the transmission of the disease by means of clothes and bedding which have been used by the sick. The period of incubation varies from a few hours to a week or more. The onset and progress of the disease differ enormously in different cases. The appearance of buboes may precede the general symptoms, but most commonly they show themselves after a day or two of high fever with grave nervous involvement, and may reach the size of a cocoa-nut. Suppuration rarely occurs in fatal cases, the poison of the disease causing death before sufficient time has elapsed to reach that stage. In the height of the epidemic catarrhal pneumonia, invariably fatal, occurred in about twenty per cent. of the cases. The mortality was far greatest among the Hindoos, and was seriously aggravated by the ignorance and obstinacy of all castes in refusing to bring their sick to the hospital until they were generally past cure. Of the first 100 recorded cases at the Brahampuri Hindoo Hospital 90 died; a month later the mortality was 83 per cent. In the Borah community, where 571 out of 1500 persons were inoculated with Yersin's preventive serum, the mortality was 45 per cent. Of 721 persons living in different places who were inoculated once only, no cases of plague developed. As to the curative treatment, the stimulant method and the administration of liquor hydrargyri perchloridi, after thorough trial, proved equally inefficacious in either controlling or checking the disease. So thirty cases were inoculated with serum antipesteux between the first and the fourth day of the disease, while one hundred other cases were treated by the usual methods. The mortality in the former was 60 per cent., in the latter 83 per cent., a saving of life of 23 per cent. The most characteristic effects of the serum in ordinary cases inoculated in the early stages are fall of temperature and amelioration of the general condition. While the serum is ineffective in the worst cases, many of which die before it has time to act, it is undoubtedly of great efficiency where the toxin poisoning is not of the gravest and where the disease does not run its most

rapid course. [At the International Medical Congress held at Moscow, Metchnikoff reported favorably as to the great benefit to be derived from the use of the serum in the treatment of bubonic plague, but said that it will be needful to produce serums stronger in antitoxic power than those used in India this year. Even with these weak serums, however, Yersin reduced the mortality from 80 to 49 per cent.]

CATTELL.

SURGERY.

On Carcinoma of the Pharnyx and its Extirpation. (*Beiträge zur klin. Chirurgie*, Vol. XIX., No. 1, 1897.) By Dr. Kroenlein.

Since von Langenbeck's paper of eighteen years ago little has been written on this subject. The author agrees with Mikulicz that the disease is not so very rare as was commonly supposed. He reports sixty-one cases; of these fifty-six were males and five were females, their ages varying from thirty-one to seventy-five years. One patient had syphilis, in two cases the parents had cancer, seventeen patients were inveterate smokers, four were tobacco-chewers, and four were drinkers. In twenty-nine cases in which microscopical examination was possible, the growth consisted of pavement-epithelium cells. The technique of operation and the prognosis depend very largely upon the seat of the growth. A carcinoma, for instance, of the base of the tongue and of the tonsils cannot be compared in these respects to one of the laryngeal portions of the pharynx. The author thereupon classifies his material according to the seat of growth. He divides the pharynx into three parts, the nasal, the oral, and the laryngeal spaces. The lower boundary of the former consists in a line drawn backward in continuation of the hard palate; the lower boundary of the oral space would be a line drawn parallel to the above at the level of the hyoid bone; the laryngeal space below this is bounded by a line drawn from the lower border of the cricoid cartilage to the sixth cervical vertebra. He further divides the laryngo-pharyngeal variety into (*a*) those of the antero-lateral wall, (*b*) postero-lateral, (*c*) retro-laryngeal or circular form. Of the naso-pharyngeal variety he reports two cases with one operation, followed by rapid recurrence and death; the other case was inoperable. Most cases reported in literature belonged to the oro-pharyngeal variety. Of this class the author reports thirty cases. Usually they originate on the lateral aspect of the pharyngeal wall or of the base of the tongue; they are unilateral, rarely bilateral. Early involvement of the cervical lymphatics is the rule in cancer of the pharnyx. Ten cases of the latter class were inoperable when they came under observation, one died of sepsis two days after admission and nine died at home. Without operation the average duration of life from first manifestation was seven months. Of the nineteen operated cases four died in connection with the operation, one has remained well

seven years, two others are still alive, one with a recurrence, the other without. All the other cases promptly recurred. Average duration of life for operated cases was 14.3 months. In regard to the technique of the operation the following rules are recommended: (1) no prophylactic tracheotomy; (2) incomplete morphine-chloroform or morphine-ether narcosis; (3) elevated position of head. The following methods were used: (1) transverse incision through the cheek, two cases; (2) temporary resection and exarticulation of the ascending ramus of the lower jaw, two cases; (3) lateral resection of the lower jaw according to von Langenbeck, five cases; (4) lateral resection of the lower jaw according to the author's own method, eleven cases. Langenbeck's method does not give enough room for the removal of the deep, infected lymphatic glands. Kroenlein's modification is as follows: Instead of the vertical incision of von Langenbeck, a long convex incision is made, beginning at the angle of the mouth, passing downward and backward at the level of the major horn of the hyoid bone over the sterno-cleido-mastoid muscle, and ending at the mastoid process. Cardinal points in the operation are temporary resection of the mandibula and bloodless procedure. The functional and cosmetic effects are perfect. If the operation is done in the above manner preliminary tracheotomy is never necessary. The patients were usually nourished with the tube, which was, however, not allowed to remain *in situ*. There were twenty-nine laryngo-pharyngeal cases; this variety is, therefore, not as rare as commonly supposed. In twenty-five cases the growth originated from the antero-lateral wall of this space, *i. e.*, the lateral portions of the sinus pyriformis (Bruns). Those originating in the lower portions of this space (*i. e.*, between the cricoid cartilage and the sixth cervical vertebra) are very much rarer (3 cases); they are circular in form. In one case the postero-lateral wall was the seat of the growth. There are, therefore, three points of predilection for these neoplasms, which also correspond to those portions of the throat most exposed to irritation during deglutition. The prognosis here is even worse than in the other groups. In seventeen cases no radical operation could be done, owing to extensive involvement of the parts. Only five patients of the year 1896 were still alive at the end of that year. The average duration of life for the inoperable cases was six months. Of eight patients upon whom the radical operation was performed six died shortly afterwards, one died three and one-half months afterwards; the other is still living; four of these six died of broncho-pneumonia (Schluck-pneumonie). The two operations devised by von Langenbeck, viz., the so-called pharyngotomia subhyoidea and pharyngo-lateralis, do not offer enough space for a thorough operation in this region. Kroenlein recommends the following method. The head is rotated to the opposite side; the incision begins at the angle of the jaw, follows a convex line downward to the lateral end of the major horn of the hyoid bone, thence parallel to either the upper or lower margin of the same. Extra-pharyngeal involvement must, of course, be removed before the pharyngeal growth can

be attacked. Kroenlein claims for his method less mutilation of structures important for the action of deglutition, and hence less danger of bronchopneumonia. In conclusion, the author shows that in his operated cases the average gain of life was seven months. One case lived seven years and the other is still well after two years. He, therefore, concludes that the operation is a justifiable one.

MUEHLECK.

Hot-Air Treatment of Painful and Partially Ankylosed Joints, and the Physiological Effects of the Local Application of Hot Air. (*Annals of Surgery*, October, 1897.) By Charles H. Frazier, M.D., of Philadelphia.

After extensive use of local hot-air baths (dry air heated to about 300° F.), the writer believes that permanent cures of local lesions symptomatic of diathetic diseases are not to be expected from them, but that this treatment is most useful for joint affections of traumatic origin, and that it will afford at least temporary relief in stubborn cases of rheumatism. He finds that the effects of hot-air baths are purely local in origin; that they temporarily increase circulation, respiration, and fever, and cause moderate fugacious local anesthesia, loss of weight (probably due to loss of water from skin and lungs), and decreased nitrogenous output.

CATTELL.

Experiments on Injuries to the Heart. (*Beiträge zur klin. Chirurgie*, Vol. XIX., No. 1, 1897.) By F. Bode, M.D.

Injuries to the heart were regarded as absolutely fatal until 1867, when Fischer, in his exhaustive monogram, collected 456 cases with 10 per cent. of recoveries. His conclusions have been confirmed by subsequent writers, although it has been shown that the prognosis depends largely upon the seat of the injuries, those of the atria being almost invariably fatal, while those of the left ventricle are slightly more favorable than those in which the right is involved. If death is not sudden, the patient may die in collapse or in consequence of hemorrhage into the pericardial cavity and consequently inhibition of the action of the heart. Modern writers are not in accord in reference to the feasibility of suture of the heart. In favorable cases Koenig advises resection of the fifth rib, opening of the pericardium, and suture of the wound, while Tillmans and Ruedinger deny the possibility of this procedure. In order to elucidate this question a series of painstaking experiments were made by the author in the laboratory of Professor Landois. These experiments should also show in what manner the heart reacts to the injuries, the symptoms, the influence of suture, and the factors most important in bringing about recovery or death. Dogs and rabbits were used; the former generally died soon after, while the latter bore the operation well. A sufficient portion of the thorax wall was resected and the pericardium opened. Neither the manipulation of the

heart nor its contact with atmospheric air had any influence upon its action. The organ was stabbed and cut transversely as well as in its long axis, with and without suture. In case of penetrating wounds the first and most important symptom is the hemorrhage; this always occurred in systole unless the wound was very large, when it also bled during diastole. The hemorrhage was most profuse from the atria, injuries to which were almost uniformly fatal. The blood which escapes from the wound prevents the filling of the ventricles; none passes through the aorta to the brain, and there is consequent syncope. According to Golz, Gaule, de Jaegers, and others, the intracardiac pressure during diastole is minus, and hence the additional danger of aspiration of air and consequent air-embolism. It is immaterial whether the wound is transverse or longitudinal. Wounds which traverse the ventricle wall obliquely and close valve-like during systole bleed less, and, since coagulation can take place only in that portion of the wound not in contact with the endothelium of the endocardium, such wounds were most favorable. If the heart is touched lightly there is no result, if pressed harder there is a prolonged systole, generally followed by another short contraction, disturbance of rhythm becoming more marked if the pressure is increased, the organ gradually returning to normal when the pressure is removed. If pressure was made upon larger branches of the coronary arteries there were short vibratory movements, and then the heart would stop, to remain so while the pressure lasted, but to begin beating again and to recover if pressure did not last too long; this did not happen, however, if a wound existed involving these vessels. Pinching of a segment of the heart with forceps also caused stoppage which lasted until removed. Continued hemorrhage from a wound of the heart interferes with its nutrition very rapidly; the contractions become weak and finally cease. The experiments showed that the proper treatment is suture of the wound. Introduction of a needle into the substance of the heart also causes a brief stoppage of the organ, but the presence of the sutures has no deleterious effect; the hemorrhage ceases, and the animal may recover. This does not hold good, however, for wounds of the atria, which are almost invariably fatal.

MUEHLECK.

On the Use of Steel Pins in Surgical Practice. (*Scottish Med. and Surg. Journ.*, October, 1897.) By Professor Thomas Annandale, of Edinburgh University.

After much experience with various methods in the fixation of bones after operations and injuries, Professor Annandale prefers pins made of good steel, from one inch to six inches long, with a rounded head and points not too sharp. These should be kept in a solution of carbolic acid in glycerin (1 to 6). He has used them in securing the bones after excision of the knee-joint and ankle, the pins being driven obliquely through a corner of the lower bone and into the lower end of the upper; in treating

oblique fractures; and in ununited fracture of the lower end of the tibia, in which case two pins were inserted, one on each side of the gap, and then drawn towards each other by means of a loop of silver wire. The pins are easily inserted, cause no undue irritation, and can be readily withdrawn. When the bones are sound, fixation is almost invariably successful.

CATTELL.

Military Surgery in Greece. (*Journal of the American Medical Association*, Vol. XXIX., 1897.) By N. Senn, M.D., of Chicago.

The Greek army had few ambulances. Donkeys and two-wheeled carts transported the sick and wounded to a field hospital; as soon as possible the patients were sent to the nearest landing and thence by boat to the hospitals at Athens and Patras. Germany and Russia sent field hospitals, which proved of the greatest value. All the hospitals were found in excellent order, with comfortable beds and well-ventilated wards. The patients received substantial food and an allowance of native wine. Greece has more doctors to its population than any other country; two thousand medical students attend the University of Athens annually. Five years' study is required for graduation, and an additional year for entrance into the army. Hence when the war broke out the numerous applications of volunteer doctors from other countries, far and near, were, as a rule, declined. The Greek Surgeon-General, Dr. Skoufas, was busy at his office daily from 8 A. M. until 2 o'clock next morning. Professor Galvani, of the University, performed daily operations at the Evangelismos Hospital with remarkable success. The Greek army had three thousand soldiers trained as litter-bearers, but of these only three hundred were non-combatants. The Red Cross Association of different countries did much to relieve the sick and wounded. Well-trained nurses from England and Denmark did efficient work in the hospitals, though at first they had some difficulty in getting a footing. Most of the dressing material was of German manufacture. The guns used on both sides were of forty-five calibre, with lead bullets as the projectiles, except one Turkish brigade, which were armed with a gun of small calibre and jacketed bullets. There was an immense waste of ammunition, the firing being mostly done at great distances. The Greeks are proverbial for honesty, modesty, and simplicity of habits; drunkenness does not exist. The excellent results which have followed the often imperfect treatment of the wounded were largely due to the unvitiated constitutions of the patients and the favorable climate. The wonderful recoveries from serious gunshot injuries show that great pains were taken to prevent infection. The instructions were to shave the injured part, rub thoroughly with iodoform, and dress with antiseptic gauze. Wire splints, and, in hospitals, plaster of Paris were used to immobilize fractured extremities. As diagnosis tags were not used, many primary dressings were removed unnecessarily; these dressings were applied by the military surgeons, the hospital corps serving simply as their assistants.

Chloroform only was used as an anesthetic, with no death therefrom. Antiseptic precautions were always taken, and wounds healed rapidly. Instruments were mostly of French make. The number of Greeks wounded was about three thousand. In no instance was laparotomy done for abdominal wounds. Dr. Tsakona said he saw two patients recover from penetrating wounds of the abdomen; the bullets passed through the body in an antero-posterior direction at or above the level of the umbilicus. A patient was seen rapidly recovering, under expectant treatment, from a wound of the chest and liver from which bile escaped for several days at first. Cases of erysipelas were few and mild; no cases of pyemia or hospital gangrene recorded. The prevailing disease among the soldiers was malaria; quinine was the only drug used in its treatment. Typhoid fever caused a few deaths; it generally pursued a mild course and was not treated by any of the aggressive methods; complications were watched for and met promptly as they appeared.

CATTELL.

NEUROLOGY.

A Contribution to the Surgery of the Spinal Cord. Cure of Paralysis, caused by Compression from an Intradural Cold Abscess, by means of Laminectomy and Opening of the Dura. (*Münchener med. Wochenschrift*, No. 27, 1897.) By Dr. Trapp.

Trapp acknowledges that many cases of Pott's disease are greatly benefited by extension; some, however, resist all such treatment. Operation for this condition has seldom been performed. He reports the case of a man who fell three metres and struck on the buttocks. The patient at once experienced pain in the back between the shoulders, and was not able to stand. He observed a prominence in the painful region between the shoulders immediately after the fall, and this prominence gradually became greater. The legs also became weak and spastic, and the reflexes in the lower limbs were exaggerated. A diagnosis of fracture of the vertebræ with resulting caries tuberculosa and compression of the cord was made. Extension was of benefit only for a time, and as the symptoms became suddenly worse, possibly from rupture of an extradural abscess into the interior of the dura, and signs of tuberculosis developed, it was decided to operate. The vertebral column and dura were opened and pus was removed, and under rest and renewed extension the patient made an excellent recovery. The case shows that even intradural abscess may be operated upon, although Chipault considers such a condition a contraindication to operation. It is also worthy of note that iodoform and glycerin were brought into direct contact with the cord after operation, without bad results. A plaster corset was worn after the operation, to afford support to the vertebral column, although all the symptoms had disappeared.

SPILLER.

The Causes of Ataxia in Tabes Dorsalis. (*Neurologisches Centralblatt*, Nos. 15 and 16, 1897.) By Dr. Frenkel, of Heiden, Switzerland.

Frenkel publishes some valuable facts in favor of the origin of tabetic ataxia in sensory disturbances. His statements are based on an examination of about a hundred and fifty cases. When ataxia is distinctly present in cases of tabes, he believes that disturbances in the perception of passive movements of the limbs may always be found. In cases of tabes in which the most careful investigation fails to find evidences of ataxia, the degree of perception of passive movement of the limbs varies; it may be normal or slightly altered, or the perception may be delayed. Important disturbances of sensation from the joints may be found in the toes or ankle without the presence of ataxia, but, if such disturbances are found in the knee or hip, the presence of ataxia may always be demonstrated. This is true *mutatis mutandis* of the upper extremities. In tabes, as a rule, one lower limb is more ataxic than the other, and the disturbance of sensation from the joints is greater in the more ataxic limb. The same is true of the upper extremities. When Romberg's sign is present the cutaneous sensibility of the soles of the feet is much altered or, in addition to this, anomalies of sensation from the joints in the toes, or from the ankle or knee joint, may be found. Romberg's sign without some disturbance of sensation does not occur in tabes. Hypotonia in tabes has much to do with incoördination.

SPILLER.

The Lesions of the Central Nervous System in Infectious Diseases. (*Comptes-rendus heb. des Séances de la Soc. de Biologie*, No. 27, 1897.) By G. Marinesco, M.D.

Marinesco examined the central nervous system in a number of cases of infectious diseases. In two cases of pneumonia he found the diplococcus of Fränkel and also an infiltration of mononuclear leucocytes in the meninges and cord. In one of the cases the cells of the anterior horns were much altered. The lesions in two cases of typhoid fever were less intense than in the cases of pneumonia, and in other cases of infectious disease the spinal cord was normal. The degree of alteration, he believes, depends on the nature and virulence of the micro-organisms and their toxins, the duration of the process, and the age of the patient. In older persons and in cases in which the affection has been of long duration, the lesions are more distinct than in the youthful or in cases in which the disease has been only temporary. Fever also causes changes in the nervous tissues. Certain symptoms of nervous origin in infectious diseases, he believes, are explained by the lesions which he has found.

SPILLER.

Tabes Dorsalis and Chronic Lead-Poisoning. (*Wiener med. Wochenschrift*, Nos. 18 and 19, 1897.) By Emil Redlich, M.D.

Redlich thinks that in some cases, probably not in many, lead-poisoning may stand in causal relation to tabes. He reports a case of tabes in a man

who had been a worker in lead. There were symptoms which indicated that the tabes was associated with disease of the anterior horns, with degeneration of the peripheral nerves, or with syringomyelia. The necropsy showed the presence of the ordinary degeneration of tabes and proliferation of the neuroglia in the anterior horns of the upper part of the cervical swelling, especially on the right side. The ganglion-cells and fibres here were degenerated. The adjoining portions of the right anterior and lateral columns were also involved. The condition was one of subacute poliomyelitis, which was supposed to have been produced by chronic lead-poisoning. Redlich refers to the fact that certain writers believe general paralysis may be caused by lead.

SPILLER.

A Case of Syringomyelia of Scapulohumeral Type with Integrity of Sensation, and Necropsy. (*Comptes-rendus heb. des Séances de la Société de Biologie*, No. 25, 1897.) By Dejerine and Thomas.

The writers report a case of muscular atrophy of the scapulohumeral type with integrity of all forms of sensation. At the necropsy two symmetrical cavities were found occupying the anterior and posterior horns of each side throughout the cord, with integrity of the median gray substance. The cavities extended into the oblongata. Secondary foci of gliosis were found in the posterior columns at certain parts. The lateral columns also were not intact. The case is interesting as demonstrating that syringomyelia may attain an advanced degree of development without causing dissociation of sensation. A slight inability to localize observed in the left superior limb the writers attribute to involvement of the left internal arciform fibres of the oblongata and the consecutive degeneration of the lemniscus. The absence of disturbance of sensation was due to the topography of the lesions, as the median gray substance was intact. The scapulohumeral type of atrophy in syringomyelia is rare, and Roth and Schlesinger state that in this form the disturbance of sensation is not seen as early and is less evident than in the other forms of the disease. Neuralgia of the face, which was observed early in this case, is explained by the involvement of the descending roots of the fifth nerves. Notwithstanding the alteration of the posterior horns, there were no evidences of Morvan's disease.

SPILLER.

PATHOLOGY.

The Serum Reaction as a Test for Typhoid Infection in Water, etc. (*New York Medical Journal*, June 5, 1897.) By Wyatt Johnston, M.D., of Montreal.

The well-known fact that injection of typhoid bacilli into an animal will produce a typhoid reaction in its blood has been utilized by the writer as a means of demonstrating typhoid infection of drinking-water, milk, etc. He

introduced one cubic centimetre of a typhoid bouillon culture into two litres of tap-water, from which eleven thousand colonies to the cubic centimetre grew on gelatin. After shaking, one cubic centimetre of the infected water was put into a second flask containing two litres of tap-water. From this dilution (one to four millions of the original bouillon culture) one cubic centimetre was placed in five cubic centimetres of ordinary peptone bouillon and grown at 37° C. for twenty-four hours. The bouillon was then sterilized for one hour at 65° C. and injected into the peritoneal cavity of a rabbit. The animal's blood examined eight days later gave a typical reaction when tested with a typhoid culture. Before inoculation the blood when tested gave negative results, as did also that from control animals. Rabbits were found to show the reaction earlier than guinea-pigs, besides being less susceptible to septic influences. The preliminary sterilization of the culture is not essential. It permits a larger dose to be given, and by averting the danger of infection by other bacteria it increases the animal's chance of surviving long enough to give the reaction time to develop.

CATTELL.

The Influence of Environment upon the Biological Processes of the Various Members of the Colon Group of Bacilli. (*Journal of Experimental Medicine*, 1897, Vol. II., No. 5.) By Adelaide W. Peckham, M.D., of Philadelphia.

Assuming the colon bacillus and the typhoid bacillus to represent the types of this group that present the greatest divergences in biological peculiarities, the author concludes that there is a series of closely-related intermediate or transitional forms. The colon bacillus is regarded as the type of this group, because its functional equilibrium, as observed in the intestine, is so permanent that it may readily be perpetuated under favorable artificial circumstances, with no conspicuous tendency to deviate from its norm; while in other members of this group there is not only a lack of uniformity in adjustment of the functions, but such as exists is readily disturbed under artificial environment, though even the typical colon bacillus may show functional modifications under particular conditions. When the members of the colon group are cultivated under circumstances favorable to the development of both the function of fermentation and that of proteolysis, fermentation always takes precedence. Cultivation of all the members of the colon group under circumstances that favor the development of proteolysis at the expense of fermentation results in an apparent increase of vigor, quickly followed by decline and death of the cell. The result of this increased activity of the proteolytic function is the formation of much larger amounts of indol by typical colon cultures than are obtained in any other way. By the method of experimentation employed to accentuate the proteolytic activity of the typical colon bacillus the function of indol formation was induced not only in atypical colon bacilli that had been devoid of it, but also in typical typhoid bacilli.

Hence the formation of indol as a differential test between the two bacilli must be regarded as of questionable value. There can be no doubt that at times the *Bacillus coli communis* possesses pathogenic properties, and that by artificial treatment it may be brought from a condition of benignity to one of virulence. Though the spleen is probably the only trustworthy source from which to obtain the typhoid bacillus, other members of the colon group may also be present therein; indeed, from such spleens all the varieties of this group seem to have been isolated. The author questions the positive value of the serum test for the differentiation of typhoid and colon bacilli, but admits that the irregular results obtained may have been due to faulty technique.

CATTELL.

Bacillus of Septicæmia Hæmorrhagica in an Infected Wound. (*Beiträge zur klin. Chirurgie*, Vol. XIX., 1897.) By George Perthes, M.D., Assistant to Prof. Trendelenburg.

The patient, a laborer forty-two years old, had received a lacerated wound of the hand while working with a meat-grinding machine. Twenty-four hours after the injury, elevation of temperature, redness, and swelling over the site of the wound showed that it was infected. Five days later a large abscess appeared above the wrist, which was incised; there was enormous swelling and edema reaching to the middle of the forearm, but without the formation of any more abscesses. On the seventeenth day the temperature fell for the first time to 38° C., but the diffuse edema continued during a long time. Patient was discharged after two months. One-third of a cubic centimetre of pus from this patient was placed in an incision 1.5 cm. long in the back of a rabbit weighing 1880 grammes; the wound was closed by suture and collodion dressing applied. The temperature of the animal varied from 38.5° to 40° C., and it died in fifty-one hours. The post-mortem showed extensive infiltration in the neighborhood of the infected spot. The internal organs showed abundant red spots; the lungs were normal. Examination of the blood taken from the heart under aseptic precautions, showed the presence of a large number of bacilli, morphologically identical with those of chicken-cholera, septicemia of rabbits, etc. Cultures were made on agar, and the organisms studied. They were non-motile, short, and somewhat variable in size, averaging 0.5 to 1.3 microns. Some small coccus-shaped organisms, probably the juvenile forms of the micro-organism, were found. Only the ends of the bacilli take the stain, leaving the intermediary portion free, thus giving the organisms a peculiar diplococcus-like appearance; they do not take Gram's stain. Grown on glycerin-sugar-agar at a temperature of 37° C. and in a damp atmosphere, a waxy circular colony of mucoid consistency appears in a few hours. Bouillon cultures become turbid, but clear up again in a few days, forming a white sediment. At 22° C. a very slight growth appeared on gelatin, without liquefaction. A temperature of 58° C. kills them in

an hour. The organisms require a very moist atmosphere: desiccation kills them rapidly. They are very virulent for rabbits and white mice; guinea-pigs proved refractory. Post mortem extensive phlegmon was found in all cases, and the organisms could be obtained in pure culture from the blood. They are, therefore, identical with the bacilli of chicken-cholera, German and American hog-cholera, etc., and are known as the bacillus of septicæmia hæmorrhagica. The author believes the patient was infected by the machine, which had been in contact with decomposed or diseased meat, and recommends that in similar cases the possibility of infection by this organism be borne in mind. This is the first recorded case of infection of a wound in a human being by this organism. Vassale reports one case and Babes another of hemorrhagic nephritis due to this bacillus.

MUEHLECK.

Bacteriological Examination of the Stools in Typhoid Fever, and its Value in Diagnosis. (*Boston Medical and Surgical Journal*, October 28, 1897.) By Mark W. Richardson, M.D., of Boston.

As the result of his investigations the writer concludes: 1. The isolation of typhoid bacilli from the dejections of typhoid fever patients is in most cases a practicable procedure. 2. The organisms rapidly disappear from the stools during convalescence; they may, however, persist for several weeks (an important fact as regards disinfection). 3. The value of the serum reaction of Pfeiffer and Widal is in most instances greater, by reason of its simplicity and its earlier appearance. In those cases, however, in which the specific blood changes necessary for the serum test do not appear until late in the disease (till convalescence or a relapse), the bacteriological examination of the stools can be of great value. 4. The results of Remlinger and Schneider, who declare the typhoid bacillus to be ubiquitous, were not confirmed by the writer: the dejections of 76 non-typhoidal patients examined by him and by other observers showed no typhoidal bacilli.

CATTELL.

Leukemia: with Special Reference to the Pathological Histology of the Blood and Marrow. (*Liverpool Med.-Chir. Jour.*, Vol. XVI. pages 300–327.) By Robert J. M. Buchanan, M.D.

The author distinguishes leukemia from simple leucocytosis by the facts that it manifests a more persistent character and that cellular elements exist in the blood, varying with the clinical form of the disease, which are not found in normal conditions, and particularly by the fact that myelocytes are present. These he describes as very large cells, with large nucleus placed eccentrically and cell granules, considered by some observers to be oxyphilic, by others neutrophilic. Many are seen undergoing mitotic division. He reports the results of the examination of eight cases, six of which were examples of leukemia. Upon the basis of these he recognizes two main divisions of the disease: (*a*) the lymphocytic, characterized by

predominating increase of small uninucleated lymphocytes of gradually increasing sizes and accretion of basophile granulations; (*b*) the splenomyelogenous, with large uninucleated myelocytes and atypical oxyphile and basophile cells, no increase of lymphocytes as a special feature. Mixed forms of these varieties may occur; in fact, Buchanan strongly questions their separate existence. Although under treatment the leucocytosis may be so diminished that the number of leucocytes per c. mm. may fall to normal, the same abnormal elements are always present in the blood and relapse invariably occurs. The primary factor giving rise to either form of the disease remains unknown, but the peculiarities shown by the persistent multiplication of a certain class of cell strongly favors the idea that the result is a proliferation of cellular elements analogous to the growth of certain tumors. Buchanan declares that he has noted many instances in which the cells in leukemia contained both oxyphile and basophile granulations at the same time. SAILER.

OBSTETRICS AND GYNECOLOGY.

Vagitus Uterinus and First Respiratory Act. (*Volkmann's Sammlung klin. Vorträge*, No. 189.) By W. Thorn.

The author reports an interesting case in which this rare phenomenon was observed. The patient was a multipara, with a somewhat contracted pelvis; left occipito-posterior position; head fixed in the inferior strait. The os was dilated with an inflated Barnes bag, which burst with considerable force while *in situ*, whereupon distinct cries of the fetus were distinctly heard twice in succession. A new Barnes bag was then introduced and left in until the spontaneous birth of a healthy male child twelve hours later. The fetal heart-sounds had remained normal throughout. Vagitus uterinus is usually looked upon as of grave import to the child, it being assumed that when this phenomenon is observed the placental circulation has become inadequate, and that the fetus, through irritation of the medulla due to imperfect oxidation, makes respiratory movements, thereby aspirating liquor amnii, meconium, and air, which latter has entered the uterus during vaginal manipulations, thus enabling the fetus to cry. In this unique case there was no evidence of asphyxia, the heart-sounds remaining normal throughout, and the child being born twelve hours later in a perfectly normal condition. Thorn explains the occurrence as follows: Through the violent bursting of the bag air was forced into the upper air-passages of the fetus. This was expelled by reflex expiratory movements caused by the violent bursting of the bag and consequent external irritation—hence the cries. Genuine pulmonary breathing was at no time present. The writer refers to the experimental work of Kuntz and Runge, who showed that Preyer's theory of the possibility of inducing genuine pulmonary breath in utero by external irritation of the skin alone is untenable, and that the theory of Schwartz, that interruption of the placental circula-

tion alone is capable of accomplishing this result, is correct. The author, therefore, concludes that we must distinguish between two distinct forms of vagitus: (1) that form, of grave import to the child, associated with disturbance of the placental circulation in utero, and (2) those cases in which the vagitus is not due to asphyxia, but is merely the result of a reflex expulsion of air forced into the upper air-passages by mechanical pressure.

MUEHLECK.

On Oöphorectomy in the Treatment of Cancer. (*British Medical Journal*, October 2, 1897.) By Stanley Boyd, F.R.C.S.

In early cases of cancer only operative measures can be recommended, but in cases where nothing local can be done or where local treatment will fail to give long immunity many measures have been tried, and some possibly with success. It is too early to judge as yet, but absolute hopelessness is not justified. The author mentions two cases of inoperable cancer both much benefited by the menopause, and thinks that by careful clinical and pathological observation or by therapeutic experiment we may discover the conditions which lead to such atrophy of cancer masses, and possibly we may further succeed in artificially producing these conditions. Dr. Beatson, of the Glasgow Cancer Hospital, was led to believe that complete oöphorectomy would do this, and has reported five cases so treated. Of these one was well two years after the operation, one much benefited for five months, but then ran down and died of a secondary growth in the liver, and the remaining cases showed only a trifling improvement. The author adds five other cases, two much improved, one slightly improved, one made worse, and one where the primary operation on the cancer and the oöphorectomy were performed at the same time and too recently to report the result as yet. The two cases without improvement were done after the menopause. He regards the cancer cells lying in the blood-vessels or lymphatics as invading parasites, and the same struggle going on against them as though they were micro-organisms, and that the "internal secretion" of the ovary in some way favors the growth of cancer by acting either upon the epithelial cells or surrounding tissue; consequently the removal of the ovaries will leave the tissues better able to cope with the parasitic cells. It is probable that the cessation of menses alone will not have this effect, but that after the ovary ceases to cause menstruation it also ceases to affect cancer, and so oöphorectomy after the menopause is of no value. These cases are all primarily breast cancers, but it is probable that other cancers would be influenced similarly. Dr. Beatson thinks that visceral growths are not arrested by oöphorectomy.

GIRVIN.

MISCELLANEOUS.

Progress of Physiology During the Last Thirteen Years. (*British Medical Journal*, August 21, 1897.) By Michael Foster, M.D., of Cambridge.

In delivering the address before the Physiological Section of the British Association for the Advancement of Science in Toronto last August, Professor Foster remarked that the thirteen years since 1884 have witnessed among English-speaking people an unprecedented development of opportunities for physiological study. Until 1883, when the present professors were both appointed, neither Oxford nor Cambridge had a chair of physiology. Since that year the British Isles and also Canada and the States have shown notable extension of physiological opportunity by the filling of professorial chairs with men who devote their whole energies to the science and by the establishment or enlargement and improvement of physiological laboratories. Never so clearly as during this period has it become recognized that each post for teaching is also a post for learning, and that among academic duties the making knowledge is as urgent as the imparting it. But these thirteen years of increased opportunity and increased fruitfulness have developed new dangers: the risk that researches will be made not for the discovery and spread of truth, but with the hope of gain, and that newly acquired knowledge may be withheld for selfish ends. In regard to the problems of the mechanics of the circulation, of muscular contraction, and the nature of secretion and transudation, distinct progress has been made towards their solution. In the field of physiological chemistry, to-day as in days before, mention of the word vitalism separates physiologists into two camps, one contending that all the phenomena of life can, and the other that they cannot, be explained as the result of the action of chemico-physical forces. Probably the time for final judgment on the question will not come until we more clearly understand what we mean by physical and chemical and what the forces so named can do and what they cannot. Chemical physiologists are already giving us ideas which we can carry into physiological problems. Fischer's work on sugars has opened a new era in the physiology of the carbohydrates by showing us how to investigate physiological problems on purely chemical lines. Another feature of the last thirteen years is the increasing attention given to the study of the lower forms of life to elucidate the properties of living matter. Results already recorded inspire the hope that in the near future a notable advance will be made in our grasp of the nature of that varying collection of molecular conditions, potencies, and changes which we call protoplasm. Here the physiologist touches hands with the botanist, and both find that they are striving towards the same end. A striking advance has been made in our knowledge of internal secretions. In 1889 Minkowski published his discovery of the diabetic phenomena resulting from the removal of the pancreas, a discovery of momentous value in itself, but especially valuable in fixing our

ideas as to internal secretion and in encouraging further research. While the results of removing the thyroid had often been vague and uncertain, removal of the pancreas led to a tangible and measurable result, the appearance of sugar in the urine. The confidence thus engendered in the conclusion that the pancreas, besides secreting the pancreatic juice, effects some notable change in the blood passing through it, spread to the analogous conclusions concerning the thyroid and the suprarenal, and suggested further experiments, by which all doubts have been removed, and it is not now a question whether the thyroid carries on internal secretion, but exactly what it does and how. And no one can now suppose that internal secretion is confined to the thyroid, the suprarenal, and the pancreas. Yet all these three lines of advance are wholly overshadowed by the researches following Golgi's modest publication in 1879. It is true that between 1870 and 1880 our knowledge of the central nervous system had made rapid progress. But in spite of the valuable results attained by improved histological technique, by the degeneration method, and by the developmental method, most of us were sitting, as our forefathers had done, before the intricate maze of encephalic structures, fascinated by its complexity, but wondering what it all meant. The physiology of hearing strikingly illustrates the advance of our knowledge in the last dozen years. To-day we can show how auditory impulses undergoing a relay in the tuberculum acusticum and accessory nucleus pass by the striæ acusticæ and trapezoid fibres to the superior olive and trapezoid nucleus, and onward by the lateral fillet to the posterior corpus quadrigeminum and to the cortex of the temporo-sphenoidal convolution. So of other sensations; all over the nervous system light seems breaking in a remarkable way. This great progress we owe to the method introduced by Golgi, aided and corrected by the researches of many others, among whom the lecturer especially mentioned Marchi, Ramon y Cajal, and A. v. Kölliker. Prior methods taught much, but failed to furnish such an analysis of the tangle of gray and white matter as to indicate clearly the paths for impulses within the central nervous system. This the method of Golgi has done. Where gold failed silver has succeeded. Thanks to the black tract which silver leaves in the body, we can now trace the pathway afforded by the nerve-cell and the nerve-cell alone. We see its dendrites branching out in various directions, each alert to dance the molecular dance assigned to it so soon as some partner touches its hand. We see the body of the cell with its dominant nucleus ready to obey and yet to marshal and command the figure so started. We see the neuraxon prepared to carry that figure along itself to parts far or near, to divert it to collaterals, or to spread out at once among numerous branches. The strong feature of the later researches lies in the fact that the results reached by histology and the degeneration method have confirmed or corrected and extended the teachings of experiment and clinical observation. The speaker believes that we are witnessing a growth which promises to be as rapid as it has been seemingly delayed; that in the not

distant future the teacher of physiology will hurry over other themes that he may have time to expound the most important truths of all, those relating to the manifold workings of the brain. In conclusion, the lecturer dwelt upon the importance of physiology as the basis of the science of healing, and spoke hopefully of the time when "physiology will take its place as a judge of appeal in questions not only of the body, but of the mind;" "will raise its voice not in the hospital and consulting-room only, but also in the senate and in the school."

T.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

AN INFANT MAY SUE FOR DAMAGES FOR INJURIES INFLICTED ON HIM EN VENTRE SA MERE.

A RECENT case[1], establishing the right of an infant to maintain an action for damages for injuries sustained by such infant while *en ventre sa mere*, involves a principle of law which is of interest to the medical profession.

The complaint in the case alleges that the defendant, St. Luke's Hospital, was engaged in the business of conducting for hire a hospital for women approaching maternity; that the mother of the plaintiff some four days before his birth applied to the hospital, which contracted with her, for a compensation mutually agreed upon, to receive and treat her during confinement, and care for her and her child then *en ventre sa mere* during the period of childbirth and convalescence thereafter; that, in pursuance of such agreement, the mother paid and the hospital accepted the compensation so agreed upon; but that the hospital, disregarding the duty thereby created to use due care and diligence for the welfare of the plaintiff, by its servants, placed the mother of the plaintiff in an elevator for the purpose of carrying her and the plaintiff *en ventre sa mere* to an upper floor of the hospital for shelter, care, and treatment, and so negligently and unskilfully conducted and operated said elevator that the plaintiff was crippled and injured.

In behalf of the defendant hospital, objections were interposed to the plaintiff's complaint, raising the question whether, as matter of law, a child after it is born has a right of action for injuries received by it *en ventre sa mere;* that is to say, whether a child unborn is a person in being so as to entitle it, after its birth, to maintain the action here sought to be maintained.

After argument on these objections, Mr. Justice Chetlain said: "The question of law applicable to the facts of this case has never been decided

[1] Allaire *vs.* St. Luke's Hospital, 30 Chic. Legal News (1897), 44.

in this country or in England, so far as counsel, and, I may add, the court, after diligent search, have been able to discover. While many cases were cited and argued by counsel, only two, cited by counsel for defendant, were directly in point.[1]

"After a careful reading of these cases and the many authorities therein cited," the court went on to say, "it will be found that the general principle is announced that a child *en ventre sa mere* is considered as born or *in esse* when it is for its benefit, and especially so when the application of the doctrine will work no hardship. Lord Coke, in the Earl of Beresford's case, said, '*filius in utero matris est pars viscerum matris*,' but he also added 'yet the law in many cases hath consideration of him in respect of the apparent expectation of his birth.'

"There are two classes of cases where it would seem just and reasonable that the rule here announced, though usually but not universally applied in equity where property rights are involved, should also obtain so far as personal actions are concerned: First, where a person wilfully inflicts an injury upon a woman with child, knowing her to be such, and for the purpose of inflicting an injury upon her unborn child, whereby such child suffers permanent injuries; and second, where a mother or other person contracts, upon a valuable consideration, for, in reference to, or in behalf of the child *en ventre sa mere*, for care and attention or other service for the benefit or safety of the child, or of both the mother and child, where the duty arises out of contract and from the relative situation and circumstances of the parties at the time of the occurrence of the acts of negligence.

"In this case, taking the allegations of the complaint, which must be admitted to be true, we find a contract made by the mother of plaintiff upon a valuable consideration, not only in reference to herself, but also in reference to the plaintiff *en ventre sa mere*. It was made by her for and on behalf of the plaintiff and for his benefit, and with the defendant, with a full knowledge by it of the condition of the mother and the existence of the plaintiff, then *en ventre sa mere*. By that contract a duty was imposed on defendant to use due care and diligence for the safety of the plaintiff as well as of the mother of the plaintiff.

"The fact that the plaintiff *en ventre sa mere* was in the elevator, and known to be by the defendant, in itself might not be sufficient to cast a duty upon the defendant to use due care and diligence toward the plaintiff, but where in addition such duty is imposed upon the defendant by its own contract, based upon a valuable consideration, should not the plaintiff after his birth be permitted to maintain this action for the breach of the duty? The court is of the opinion that it should, and that the plaintiff in his complaint has stated a good cause of action and is entitled to maintain it." And the objections of the defendant to the plaintiff's complaint were overruled.

[1] Dietrich *vs.* Inhabitants, 138 Mass. 14; Walker *vs.* Great Northern Ry. Co., 28 L. R. (Ire.) 69.

BOOK REVIEWS.

A System of Medicine, by Many Writers. Edited by Thomas Clifford Allbutt, M.A., M.D., LL.D., F.R.C.P., F.R.S., F.S.A. Vols. III. and IV. New York: The Macmillan Company. 1897. 8vo, cloth. Price, for each volume, $5.

The third volume of this system of medicine takes up the class of infective diseases considered in Volume I., and it deals with the most important diseases that the general practitioner has to treat. The reader at once notes the prominent place which the general subject of bacteriology claims in the discussion of various subjects. The authors in most instances present whatever is known at the present time on the intricate subject of etiology, the advances in pathology are duly recorded, and, as a rule, the paragraphs on treatment are satisfactory. At first glance one apparently notes a marked exception in the opening chapter on tuberculosis, where the subject of treatment is dismissed in seven lines. We soon see, however, that this part of the subject is to follow, by another author, in another volume. We consider this a grave fault in the work. It was bad enough to divide the subject of diphtheria among four authors in the first volume; but scattering divisions of a subject between the two volumes is inexcusable. The statement of Dr. Sidney Martin, on page 41, that there is no specific treatment for tuberculosis leaves out of account the treatment by antitubercular serum, which has been used by Maragliano and others. The article on leprosy, by Dr. P. S. Abraham, is full of interest. His statement as to the contagiousness of leprosy is as follows: "If leprosy be 'contagious' in the ordinary sense of the term, it must be so in a comparatively very slight degree, far less so, indeed, than tuberculosis."

The article on dengue, by Dr. Patrick Manson, is well written, and, in connection with Dr. Andrew Davidson's article on yellow fever, is especially interesting to Americans at the present time. The prevailing epidemic on the Gulf coast of the United States was at the start a widespread epidemic of dengue, in which very soon a few cases of yellow fever appeared, and from these there have rapidly been developed numerous cases of the dread disease. Dr. Davidson gives prominence to the plan of treatment devised by Surgeon-General Sternberg, which consists of bicarbonate of sodium and bichloride of mercury in an ice-cold solution taken internally. The author's statistics as to the mortality of yellow fever are for the most part a century old, and are therefore of only historic interest. At the end of the volume will be found an addendum relating to Sanarelli's reputed discovery of the microbe of yellow fever. It will be remembered that Dr. Sternberg eighteen years ago discovered a bacillus which he called bacillus X, and he was able to demonstrate it in about one-half of the cases examined; but it remains to be seen whether Sanarelli's bacillus will be established as the true germ of yellow fever, the chances being at present strongly in its favor.

The subject of vaccinia is treated by three authors in one hundred and thirty pages. The article on rabies, by Dr. Sims Woodhead, is a valuable contribution on this malady, and is commended to those who wish an unprejudiced account of this subject. Malarial fever is briefly but ably treated by Dr. William Osler. The article, by Professor Charles J. Martin, of Melbourne, on snake-poison and snake-bite, and the appendix, by Dr. Calmette, are admirable as a thoroughly scientific exposition of the subject, and they contain the most recent information in this field. The various poisons are next considered, and the volume closes with a consideration of the internal parasites.

It is impossible to notice all the valuable articles embraced in the fourth volume; suffice it to say that they are forty-eight in number and with twenty-four illustrations. After considering diseases of obscure causation, in which are included rheumatism, arthritis, rickets, osteomalacia, gout, and diabetes, the remainder of the volume is occupied by an excellent series of articles on diseases of alimentation and excretion. In the first group especial mention should be made of the contribution by Dr. W. B. Cheadle on rickets. This subject is treated in a very interesting manner, and the various aspects of rickets are illustrated by characteristic photographs. The article on diabetes mellitus, by Dr. Saundby, is a good example of clear and forcible writing. The directions as to treatment, both climatic and dietetic and the use of drugs and mineral waters, are well stated. As an introduction to the second group of papers we have an article by the late Dr. Charles Henry Ralfe and Dr. W. Soltau Fenwick, and one by Dr. Rose Bradford on the general physiology of secretion. Dr. Fenwick also treats the important subject of dyspepsia. The editor contributes a very interesting but brief paper on mountain-sickness and a somewhat more extensive one on dilatation of the stomach. Julius Dreschfeld's contribution on ulcer of the stomach is thorough and supplemented with a valuable bibliography. Indeed, all the articles are amply provided with references for collateral reading.

We consider the best articles in the volume those written by Mr. Frederick Treves on acute peritonitis, intestinal obstruction, perityphlitis, and enteroptosis. Mr. Treves discards "the uncouth name appendicitis," and reintroduces our old friend perityphlitis, too long forgotten and probably quite unknown to many a recent graduate. We naturally turn to his paragraphs on operative interference, and it is interesting to find this well-known surgeon maintaining a conservative position on this point. He says: "It may be laid down as a rough rule that the use of the knife will very seldom be called for before the fifth day. Indeed, I would venture to think that surgical interference before the fifth day should not be undertaken except in the presence of emphatic symptoms." He takes issue with an "American surgeon" who considers that all cases of appendicitis are imminently dangerous to life from the beginning of the attack, claiming that such a statement is absolutely at variance with facts. Mr. Treves goes on to say that "the cases which undergo spontaneous cure form an overwhelming majority, and cannot be lost sight of, nor can the opening of the abdomen through the muscular parietes over the cecum be regarded as a trifling procedure." He condemns the use of the exploring needle. Mr. Treves proposed the operation for removal of the appendix between the attacks as early as 1887, and states that he has operated during the quiescent stage in over one hundred and fifty cases of relapsing perityphlitis with only one death. He is, by the way, not above the use of a little morphine in the treatment of acute cases.

The volume as a whole is of a high grade and is thoroughly up to date and satisfactory. There still seems to be some discrepancy in numbering the volumes: we read on the cover "Volume IV.," but at the close of the text, "End of Volume III."

G. H.

LECTURES ON THE MALARIAL FEVERS. By Wm. Sidney Thayer, M.D., Associate Professor of Medicine in the Johns Hopkins University. 8vo, pp. 326, with 19 charts and 3 chromo-lithographic plates. New York: D. Appleton & Co., Publishers.

The nineteen lectures upon the malarial fevers that form the contents of the volume before us embrace an historical sketch of the evolution of knowledge

on the subject; a description of the hemocytozoa of malaria; the general conditions under which malaria prevails; the modern views with regard to the channels through which it is disseminated; a detailed treatment of the various clinical manifestations of the fever; the morbid anatomy of malaria; and the diagnosis, prognosis, prophylaxis, and treatment of the disease. There are nineteen charts illustrative of the clinical course of various types of malarial infection, and three excellent colored plates depicting the morphology of the malarial parasite in its numerous phases of development.

To those who are familiar with the investigations of the author in this particular field of work it would be superfluous to emphasize the value of these lectures. The abundant opportunity that he has enjoyed during the past few years for the study of the manifold expressions of this disease and the untiring energy with which he has devoted himself to the work are sufficient guarantee for the quality of the matter contained in this publication. One of the special charms of the book is that it is very largely the outcome of personal observation, though an equally important feature is the wealth of literary reference that is presented in confirmation or in refutation of views that the writer feels justified in holding as a result of his own experiences.

The chapter descriptive of the malarial parasite and its manifold developmental phases is all that can be desired; that treating of the newer views concerning the mode of dissemination of malaria should be most welcome to the student of preventive medicine; while the section devoted to the treatment of malaria presents in detail the numerous methods that have been employed and discusses their relative values.

The lectures throughout are accurate and concise, fully up to the times, and contain practically all that is definitely known upon this interesting and important malady. We feel no hesitancy in pronouncing it the most important treatise upon the malarial fevers in the English language.

A. C. A.

The Vertebrate Skeleton. By Sidney H. Reynolds, M.A., Trinity College, Cambridge; Lecturer and Demonstrator in Geology and Zoölogy at University College, Bristol. Cambridge: At the University Press. 1897. Pp. 559. Figures 110. The Macmillan Company, 66 Fifth Avenue, New York. $3.00.

Since nearly one-half of this work is devoted to the Mammalia, it is fair to suppose the author intended to prepare a thesis which should appeal to those interested in the anatomy of man and of forms related to him. The text is technical and it is impossible in a brief notice to enter into details, though this much may be said—that, considering the high grade of excellence attained throughout the volume, it is to be regretted that omissions occur in the accounts of the amphibian sternum, a structure so important to the true classification of the group. The description of the teeth and skeleton of the Chiroptera is also defective. A word of commendation is due the author for his acknowledgment of work done by students on this side of the Atlantic. As is necessary in a work of the kind, the illustrations are numerous and effective.

H. A.

Anatomy, Descriptive and Surgical. By Henry Gray, F.R.S., Lecturer on Anatomy at St. George's Hospital, London. New and thoroughly revised American edition, from the 13th English edition, much enlarged in text, and in engravings in black and colors. In one imperial octavo volume of 1239 pages, with 772 large and elaborate engravings on wood. Price of edition

with illustrations in colors: Lea Brothers & Co., cloth, $7.00; leather, $8.00. Price of edition with illustrations in black alone: cloth, $6.00; leather, $7.00.

This standard work needs no introduction to the student desiring to purchase an anatomy, for its excellent and sterling merits are known to all. We have often wondered why the name of Keen no longer appears on the title-page, as his labors on one of the former editions have been incorporated in the body of the work.

CATTELL.

A TEXT-BOOK OF THE PRACTICE OF MEDICINE. By James M. Anders. Philadelphia: W. B. Saunders. 1897.

To justify the perpetration of another Practice of Medicine an author must either have a class of students to whom he desires to render his own peculiar views readily accessible, or else aim to produce something of permanent value to medical literature. We suspect that Professor Anders had the former object in view when he first thought of writing the present work, and that he has kept it in view throughout the whole period of preparation is very evident. Each disease is considered systematically, and, as far as possible, the various points in its description are grouped under subheadings. Moreover, there are a number of valuable tables of differential diagnosis, particularly one upon functional and organic systolic heart murmurs, to whose importance he justly calls attention in the preface. We are sure that the book is one that will admirably serve the purpose of a text-book to the student; but it is more than this, for it is an ambitious and not unsuccessful attempt to picture modern medicine, not in the form of an abstract of current knowledge, but as seen and interpreted by an intelligent observer. The book is well up to date: for example, the reproductions of X-ray pictures seem designed more to illustrate real morbid conditions than to impress the casual purchaser; the micrococcus Melitensis is mentioned as the probable cause of Malta fever; and lumbar puncture is suggested in suitable spinal cases. On the other hand, we should like to have seen some reference to the employment of calcium salts in hemophilia, and the inclusion of syphilis as one of the more frequent causes of acute yellow atrophy of the liver. A few omissions, however, and there seem to be very few, must be expected in a first edition, and we do not doubt that there will soon be opportunity for their correction. A satisfactory feature is the insistence upon the observance by the physician himself of a reasonable degree of precaution, as, for example, in the discussion of scarlet fever. The book is long (1259 pages), but well printed and readable, and furnished with a complete index of 27 pages more; nevertheless, the volume is not bulky. We can cordially recommend the book to all physicians interested in the subject of internal medicine.

J. S.

CONSTIPATION IN ADULTS AND CHILDREN, with Special Reference to Habitual Constipation and its Most Successful Treatment by the Mechanical Methods. By H. Illoway, M.D., formerly Professor of Diseases of Children, Cincinnati College of Medicine and Surgery; formerly Visiting Physician to the Jewish Hospital, Cincinnati, etc., etc.; Member of the Medical Society of the County of New York, of the New York County Medical Association, etc. New York: The Macmillan Company; London: Macmillan & Co., Ltd. 1897. Cloth, $4.00.

In the first part the author considers constipation in adults, to which he devotes thirty-two chapters, making use of ninety illustrations; in the second

part we find fourteen chapters, illustrated, and closing with a valuable formulary. The author treats the subject in a systematic manner. He devotes twenty-seven pages to the anatomy of the structures involved. This introductory chapter is fundamental, and cannot be overlooked if one is to understand the causation and treatment of constipation. It is rare that the medical student dissects the bowels. They are, as a rule, removed to make way for more interesting structures, and the practitioner too often contents himself with the use of an A, B, and S pill, phosphate of sodium, or what not, to the neglect of truly curative measures. Constipation is a very large subject, and the five hundred pages of the work before us are not too much to properly treat of it. It is remarkable that a thorough work such as this is should not have appeared before. The author enumerates the following causes leading to the impairment of the proper physiological function of the bowel: 1. Neglect to attend to the calls of nature. 2. The pernicious habit of reading at stool. 3. Food defective in residual matter. 4. Food deficient in fats. 5. Habit of abstaining from cold water. 6. Want of sufficient physical exercise. 7. Muscular weakness of the abdominal walls. 8. Obesity. 9. Prolonged mental work and worry. 10. Bad teeth. 11. Old age. For each of these conditions appropriate treatment is fully described. The book is useful and timely, printed from large type on handsome paper, and will be highly appreciated.

G. H.

Transactions of the Michigan State Medical Society for the Year 1897. Volume XXI. Grand Rapids: Published by the Society. 1897.

This volume contains forty-two papers besides the usual business records of the Society. The book is well printed and is edited by the Secretary, Dr. Collins H. Johnston, of Grand Rapids. The only paper contributed by an outsider is the address on Surgery, by Dr. Roswell Park, entitled "The Problems which most Perplex the Surgeon." He deals with the conditions present in cases of acute and gangrenous appendicitis and the nature and causes of cancer. The latter subject is treated in the light of the very latest investigations, and the author makes some valuable suggestions as to the methods by which we may hope to obtain a better understanding of this disease.

Dr. Henry B. Baker's remarks in opening a discussion on five papers relative to "Preventive Medicine" are extremely interesting, and show what an advanced standard of dealing with preventable diseases is maintained in Michigan. That State maintains that the safety of the people is the supreme law; that the chief duty of any government is to do for the safety of the people, individually and collectively, whatever they are unable, singly or by other practicable voluntary associations, to do for themselves. Michigan laws compel notification of every dangerous communicable disease wherever it occurs throughout the State, with prompt isolation and restriction of every person and thing infected with a dangerous communicable disease.

A law passed by the Legislature of Michigan in 1895 provides as follows:

"There shall be taught in every year in every public school in Michigan the principal modes by which each of the dangerous communicable diseases is spread, and the best methods for the prevention and restriction of each disease. The State Board of Health shall annually send to the public school superintendents and teachers throughout the State printed data and statements which shall enable them to comply with this act."

We trust the day will come when all of our States will follow the lead of Michigan in thus seeking to protect the citizen by showing him how he can best protect himself.

G. H.

NOTES AND NOTIONS.

American Medical Colleges.

In the recent "educational number" of the *Journal of the American Medical Association* are to be found the names of 104 medical schools in the United States, 58 of which have maintained membership in the Association of American Medical Colleges and some in the Southern Medical College Association. This list does not by any means include all the schools in which medicine is taught, as it makes no mention of the many medical institutions under the control of the homeopaths, eclectics, hydropaths, osteopaths, Christian scientists, etc. Allowing that there are in this country 175 medical schools, with an average teaching force of 40 each, of the entire medical profession in America one physician in every sixteen is connected as a teacher with a medical school. Towns whose geographical situation or even existence is unknown to persons of average education may contain a medical school. What a favorable opportunity for the study of clinical medicine in the wards of the numerous hospitals, clinics, and dispensaries there must be in a town of 2308 inhabitants where one of these colleges holds forth! The yearly tuition varies from a small matriculation fee to two hundred dollars a year. Students can have their choice between schools exclusively for men, schools for women, and co-educational schools. One of the most recent and most specialized schools is situated in Brooklyn, N. Y., with the title of the Brooklyn Post-Graduate School of Clinical Electro-Therapeutics and Roentgen Photography. In Chicago there are eleven regular medical schools. One can now study medicine by night sessions, as in the schools of pharmacy. From the announcement of the Medical Department of the University of the State of Missouri, we learn that all the laboratories at that institution are conducted by able men, living upon adequate salaries, *not* practising their profession, but giving their entire time to teaching and original investigations. Would that more medical schools could make the same statement! Many a physician of promise has been turned away from his chosen pursuit of original lines of investigation, because his time was taken up in earning a living by the routine practice of his profession.

CATTELL.

The San Francisco Health Department.

THEY seem to have a very progressive Health Department in the City and County of San Francisco. With a population of 360,000, its death rate for August was only 1.17 per 1000. During that month there were but twenty-three cases of diphtheria reported, with six deaths, and eight cases of scarlet fever, with one death. The birth-rate exceeded the death-rate by one hundred and eighty. Sixty-one tuberculous cows were slaughtered, and the carcasses disposed of for fertilizing purposes, out of two hundred and thirteen examined. There is a special bath and laundry inspector,

who found fifty-nine laundries in good condition and one hundred and twenty-eight in bad condition. A number of houses of prostitution have been closed until such times as the owners thereof thoroughly rebuild the dilapidated portions and place therein sanitary plumbing. Since the issuance of the last monthly report ten physicians arrested for failure to register births within the time prescribed by law were found guilty and a fine of ten dollars imposed in each case. A mother also failing to register a birth, no physician being present, was found guilty and fined ten dollars. We trust that the death of Dr. A. S. Lovelace, the health-officer, on September 23, 1897, will in no way interfere with the future efficacy of the board.

CATTELL.

Alvarenga Prize of the College of Physicians of Philadelphia.

THE College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about one hundred and eighty dollars, will be made on July 14, 1898, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered. Essays intended for competition may be upon any subject in medicine, but cannot have been published, and must be received by the Secretary of the College on or before May 1, 1897. Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within the name and address of the author. It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award. The Alvarenga Prize for 1897 has been awarded to Dr. Joseph Collins, of New York, for his essay entitled "Aphasia."

CATTELL.

Poisoning by Carbolic Acid.

CARBOLIC acid is at the present time one of the most popular drugs employed for the purpose of committing suicide. Among the reasons which may be assigned are the ease which it may be obtained, the certainty and quickness of its action, and the freedom from pain often noticed, which is due to the anesthetic action of the drug on the sensory nerves. In the attempt to wash out the stomach the membrane formed by the caustic action of the drug and the incident degeneration, inflammation, and necrosis is often, by the passage of the esophageal tube, shoved downward from the upper portion of the esophagus and impacted in its lower part near the entrance into the stomach. This membrane presents in the esophagus, but not in the stomach, a silvery lustre, which darkens on exposure to the air. That the carbolic acid is quickly absorbed is proved by the observation that its odor can sometimes be recognized on section of the kidney when it cannot be detected in the stomach.

CATTELL.

Died at His Post.

Dr. W. D. Bratton, Passed Assistant Surgeon of the United States Marine Hospital service, though an invalid and therefore on waiting orders, died on October 1st, under peculiarly distressing circumstances. In the pressing need for medical officers for active work during the present yellow fever epidemic in the South, Dr. Bratton promptly volunteered for active duty, and the tender was accepted in the spirit in which it was made. He was ordered to Sabine Pass to assume charge of service matters relating to the quarantine at that port, and, after superintending the disinfection of a vessel, returned to the ship to reassure himself upon the work done. In doing so, he fell through an opening in one of the decks and died in eighteen hours. Dr. Bratton was born in South Carolina in 1860. After entering the U. S. M. H. S., he developed tuberculosis, and, while on waiting orders in Arizona and New Mexico, made a careful study of the climatic treatment of consumptives and published several reports on the climate of that region. He was a member of the American Climatological Association.

Hinsdale.

The American Public Health Association.

The American Public Health Association held its twenty-fifth Annual Meeting in Philadelphia, October 26–29, 1897. The President was Dr. Henry B. Horlbeck, of South Carolina; the chairman of the Committee of Arrangements was Dr. Benjamin Lee, Secretary of the Pennsylvania State Board of Health, and the chairman of Committee on Entertainments was Dr. Charles E. de M. Sajous, who has lately returned from Paris to Philadelphia. The meeting was a success both from a scientific and a social stand-point. The city of Philadelphia, recognizing its indebtedness to men who are devoting their lives to advancing the knowledge of hygiene and preventive medicine, voted the sum of three thousand dollars towards a fund for properly entertaining the delegates, who came from all over the United States, from Canada, and from Mexico, most of them officially connected with municipal governments. Such conferences do an immense amount of good by disseminating practical knowledge of the means best calculated to prevent or check the spread of various diseases. The sanitary exhibit made by various cities was particularly instructive, and one who took the pains to examine the methods adopted, as for instance by the great city of New York, must have been impressed by the earnest and thorough effort made in dealing with all forms of disease. Excellent exhibits were also made by the city of Buffalo and by the city of Reading. The various bacteriological products, disinfecting apparatus, etc., were among the instructive features of the meeting. One of the most interesting discussions was upon the subject of yellow fever. Those who listened to Dr. George M. Sternberg, Surgeon-General U. S. A., were naturally interested in hearing from his own lips the latest developments as regards the bacillus of yellow fever. While detailing his own work in this field during the last ten years, and his observations on the bacillus X which he has sought to identify with this

disease, he very generously accorded to Sañarelli due credit for his brilliant work now attracting world-wide attention, and expressed the belief that the *Bacillus icteroides* of Sañarelli is no doubt closely related to the organism which he discovered some years ago. Dr. Sternberg remarked that, just as we find various forms of the typhoid bacillus and the colon bacillus, so there may be variations in the yellow fever bacillus. Sañarelli's bacillus is said to be motile while the bacillus X is not. The comparisons, however, have not yet been completely carried out, but Dr. Sternberg, who has just brought from Paris a pure culture of the *Bacillus icteroides*, will immediately institute a comparison of it with the behavior of cultures taken from cases recently observed in Southern States. Dr. Sternberg sees no reason to doubt the efficacy of a serum in combating yellow fever, inasmuch as the serum from animals rendered immune produces immunity in other animals; thus small doses of the filtered culture would probably give immunity when injected into the human subject. Sañarelli, furthermore, obtained a definite reaction on mixing blood serum taken from a yellow fever subject with the filtered culture, and we may thus have a diagnostic aid. Papers on tuberculosis, by S. A. Knopf, of New York, S. W. Abbott, of Boston, and Benjamin Lee, of Philadelphia, attracted a great deal of attention. Much credit is due to His Honor Mayor Warwick, to public-spirited citizens of Philadelphia, to the medical colleges, and to the Woman's Health Protective Association for heartily coöperating to make the silver anniversary of the Association a success, and for maintaining the high standard of Philadelphia hospitality.

HINSDALE.

The Caleb Fiske Prize Essay.

THE subject for the next Caleb Fiske Prize Essay is "The Neuron Theory as related to Brain and Nerve Disease, in the Light of the Most Recent Investigations." The amount offered is $350. Competing essays are to be sent to the Secretary of the Trustees of the Fund, Dr. George L. Collins, 223 Benefit Street, Providence, by May 1, 1898.

NOTE TO CONTRIBUTORS.

AUTHORS will receive liberal compensation for all accepted articles after publication; or 250 reprints, if asked for on the manuscript, will be furnished in lieu of the honorarium. It is distinctly understood that all articles appearing as original matter are for our exclusive use, and are not to be reprinted or to appear in any other publication excepting the Transactions of the Society before which the paper may have been read. Illustrated papers are especially desired.

All matters of business, as well as subscriptions, should be sent to the INTERNATIONAL MEDICAL MAGAZINE COMPANY, 3709 Spruce Street, Philadelphia.

Manuscripts, exchanges, and books for review should be addressed to the Editorial Office, 3709 Spruce Street, Philadelphia.

REFRIGERATING APPARATUS USED BY THE DEPARTMENT OF ANATOMY AT THE UNIVERSITY OF PENNSYLVANIA.

FIG. 1.—*A*, bath; *B*, air-condenser and injecting apparatus; *C*, pulley suspension apparatus; *D*, exterior of refrigerating box; *E*, odorless excavator barrels.

FIG. 2.—*A*, recording thermometer and middle tier of shelving; *B*, tiers of shelving, south side; *C*, brine tank; *D*, tiers of shelving, north side; *E*, pipes of refrigerating apparatus.

INTERNATIONAL
MEDICAL MAGAZINE.

Vol. VI.] DECEMBER, 1897. [No. 12.

ORIGINAL COMMUNICATIONS.

REFRIGERATION AS A MEANS OF PRESERVATION OF BODIES FOR USE IN THE DISSECTING-ROOM.

BY EDMUND W. HOLMES, A.B., M.D.,
Demonstrator of Anatomy at the University of Pennsylvania.

THE importance of the dissecting-room as a means of medical education has always been recognized in theory in every medical school, but the collateral branches and the prominence given to the merely didactic methods have too often crowded it into a dark and dismal corner, "out of sight and out of mind." With the increasing influence of the clinical methods, bedside teaching will go hand in hand with personal instruction upon the cadaver, so that the supply of bodies and their preservation will become more and more a question of moment, as the classes become larger, more strict supervision is exercised, and a higher grade of work is required.

A recent journal remarks that at Cambridge, England, the study of anatomy is seriously embarrassed by the scarcity of material; likewise the prejudice in our own communities makes it exceedingly difficult to enforce strictly the anatomical laws under which our supplies of bodies are obtained; so that it behooves each institution to preserve with the utmost care the material apportioned to it. The older methods of immersion in alcohol or brine were inadequate, and responsible in a degree for the antipathy to dissection among the students themselves. The more the work becomes systematized the more evident this becomes, because, while under a careless *régime* the student simply shirked and was glad of the excuse, with enforced dissection the objection is quickly and more forcibly emphasized.

Refrigeration, recently introduced at the University of Pennsylvania, has, in one form or another, been tried in a number of our schools. It requires for its success much greater care, and consequently exacts harder work and more time from the attendants in the dissecting-room.

It is a mistake to suppose that anybody can inject, and that any body can be injected in twenty minutes. Considering the scarcity and the actual cost of cadavera and that they cannot be replaced at any price, there is no branch so misunderstood and no work so undervalued. A good embalmer is a most valuable adjunct to any medical school, and such a one versed in the preparation of the various preservative solutions and of the different coloring masses, and their proper and thorough injection, would, if properly appreciated, command a handsome salary. In some of our schools the waste of dissecting material is hardly less than shameful.

At the University of Pennsylvania the bodies as soon as received are thoroughly cleansed, the hair shaven from the scalp and about the pubes, and the body injected by both femorals with equal parts of alcohol, glycerin, and carbolic acid. A fifty per cent. solution of zinc chloride is used when decomposition has already set in. To avert advanced putrefactive changes zinc chloride is by far the most valuable agent. Formalin has been tried to a limited extent, but has not given satisfaction. It has little penetrating power, doubtless because it hardens the tissues with which it comes in contact, and its solutions evaporate rapidly, a mould forming upon the exposed surfaces. It therefore can be employed only in cases where the dissections when not in use are kept completely immersed. On account of the indurating effect, weak solutions (two per cent.) may be preferable to the stronger (ten per cent.).

The injection is done by compressed air (Fig. 1), one to five pounds pressure being ample, a T being used so as to throw the fluid in both directions at the same time. The body is then suspended, by tongs in the ears, for twenty-four hours, so as to insure thorough infiltration of the legs and feet, the most difficult parts to preserve; after which the color mass, of which starch or glue is preferable to the preparations of plaster of Paris, is thrown in. A few hours having been allowed for this mass to harden, the body is thoroughly dried, anointed with petrolatum, wrapped in tissue paper, in turn covered with muslin rollers, and then placed in the refrigerating room.

The box is of sufficiently simple construction. It consists of a light sheathing of yellow pine upon which is tacked thick rosin paper, then there is another layer of sheathing, next another of paper, and then sheathing again, after which a space four inches wide is filled with "crumbs of cork," and the sheathings of wood and rosin paper are repeated, making the whole wall about seven inches thick (Fig. 2). In the interior are three rows of shelves which afford room for about 115 bodies, but doub e that number can be accommodated if necessary. The alcoves are lettered and numbered, and each body has its tin tag upon it, so that if reclaimed it can readily be found. The ammonia process is used. The refrigerating plant is run by a dynamo controlled from the central light and heat station. The pipes are placed overhead, while on either side is a tank for brine, reservoirs of cold, which will keep the box at a low temperature for several hours

in case of a break-down in the machinery. During the winter months it is only necessary to run the dynamo about six hours, at night. A registering thermometer indicates the diurnal variations of temperature, the average being about 20° F.

The advantages of this method of preservation are: the thorough cleanliness, which is imperative; the fact that the bodies are always under supervision when in storage; the anointing of the skin, which renders it pliable and easy to dissect; while, if properly injected with preservatives, the bodies keep well upon the dissecting tables. The slimy appearance of cadavera packed in ice and salt, the water-logged condition of those soaked in brine, and the hardening of those immersed in alcohol are avoided.

With proper injecting apparatus, a skilled injector, a modern refrigerating plant, the recognition of the need of bedside methods in the dissecting-room, and the insistence upon personal dissecting and demonstration rather than a main dependence upon the lecture and the quiz, it is hoped that the medical schools may turn out students competent to practise medicine and surgery, rather than glib automatons to pass examinations.

The successful medical schools of the near future will be those having the largest supply of clinical material, the best-equipped laboratories, and affording the most direct personal, individual instruction.

INTRA-TYMPANIC SURGERY, ESPECIALLY IN CHRONIC PURULENT OTITIS MEDIA.

BY CHARLES H. BURNETT, A.M., M.D.,

Clinical Professor of Otology, Woman's Medical College; Aural Surgeon, Presbyterian Hospital, etc., Philadelphia.

My experience in intra-tympanic surgery has been gained by 109 operations within the drum-cavity, up to the present time (June, 1897),—viz., 53 operations for the relief of chronic catarrhal deafness, 26 operations for the relief of chronic tinnitus and tympanic vertigo of catarrhal origin (Ménière's symptoms), and 30 operations for the relief of chronic purulency of the middle ear. In this article, however, are given brief notes of the 30 cases last named and the operations performed for their relief. The first of these operations constitute some of the earliest of their kind performed in this country. The statistics pertaining to them, therefore, have the advantage of being based on long subsequent observation.

In all of these 30 cases various routine methods had been employed for their cure before resorting to intra-tympanic operations. The latter have been performed upon the etherized patient, with one exception, viz., Case VIII., in which the dangling malleus was removed like a polypus, with the polypus-snare. The ear of the etherized patient has been illuminated by means of a three-candle-power electric head lamp, held in place like the

forehead mirror by a head band, and supplied by a portable battery of six volts. All of the cases have been either private patients or patients in the wards of a hospital, under as careful observation as if they had been private patients. Though some of the 30 cases have finally passed from observation and correspondence, they remained under observation long enough for fair conclusions to be formed regarding some of the results of the operation. The ages have varied from six years to forty-seven.

Case I.—Miss M., of Philadelphia, aged twenty-three. Attic suppuration and deafness in the right ear for six years past; sole perforation in the membrana flaccida. July, 1889, excision of the membrana tympani and malleus; the head of the latter destroyed by necrosis; no trace of the incus. Cessation of the discharge, regeneration of the membrana tympani, and great improvement in hearing (from nothing to fifteen feet for isolated words) in the course of two months after the operation.

Case II.—Miss F. D., of Philadelphia, aged forty-eight, had been under my observation and treatment for many years for chronic suppuration of the left attic; sole perforation in the membrana flaccida. May, 1890, excision of the membrana and malleus; no trace of the incus. Entire cessation of discharge in twelve days; greatly improved hearing; irritation of the chorda tympani (metallic taste) on the side of the operation persisted for six months, gradually fading away.

Case III.—Helen S., of Philadelphia, aged thirteen. Chronic suppuration in the atrium of the right ear, with history of mastoid abscess several years before seen by me; scars on the mastoid. Ordinary treatment failed to check the otorrhea. June 11, 1890, the membrana and malleus were excised; inner surface of the membrana tympani covered with granulations; manubrium of the malleus almost entirely destroyed by necrosis. The discharge was greatly diminished and the hearing improved (from one foot to six feet) by the operation.

Case IV.—Mr. W. H. R., of Philadelphia, aged thirty, had suffered from chronic suppuration in the right ear for many years; had a sudden attack of earache and vertigo in the street, with great increase in deafness. Inspection revealed a chronic suppuration within the attic and atrium; perforations in the membrana flaccida and membrana tensa. Ordinary treatment for months failed to check the otorrhea. June 17, 1890, the remnant of the membrana and the partly necrotic malleus were excised. Cessation of the discharge in the course of a year; cicatrized fundus. Deafness unchanged; no return of vertigo.

Case V.—Mrs. Chas. G., of Idaho, aged thirty-two. Chronic suppuration of the atrium in the right ear. July 7, 1891, the membrana and malleus were excised; malleus handle necrosed up to short process. Discharge ceased in two months; the hearing was greatly improved.

Case VI.—Rev. J. C., of Massachusetts, aged thirty-seven. Chronic attic suppuration for twenty years; sole perforation in the membrana flaccida. September, 1891, the membrana and malleus were excised; a little pus was found in the atrium. Nearly total cessation of discharge in the course of a year; the hearing slightly improved.

Case VII.—Edna Y., of Pennsylvania, aged eleven. Chronic suppuration of the atrium. October 7, 1891, excision of the membrana and malleus; malleus handle eroded by necrosis. Diminution of discharge; hearing improved; death from diphtheria a month after the operation on the ear.

Case VIII.—Grace H., of Philadelphia, aged twenty. Chronic suppuration of attic and atrium; total destruction of membrana flaccida and membrana tensa excepting anterior half of latter, to which the malleus was attached. Latter was

seized by polypus-snare and removed, without pain to the unetherized patient. Total cessation of discharge in a few weeks, until March, 1897, when I removed a small cholesteatomatous mass from the attic and atrium. The discharge has ceased again. There has never been any regeneration of the membrana in this case; hence the easy and perfect drainage in the recent cholesteatomatous suppuration.

Case IX.—Miss E. G., of Maryland, aged twenty. Chronic suppuration of the atrium and secondarily of the attic; sole perforation in the membrana tensa, in the upper posterior quadrant; complicated by ozena. March, 1892, remnant of the membrana and the malleus excised. Hearing slightly improved; discharge diminished.

Case X.—B. B., of Philadelphia, aged twelve. Chronic suppuration of the atrium; sole perforation in lower part of the membrana tensa. Excision of remnant of the membrana and malleus. Cessation of purulency in the course of a month; great improvement in hearing—from two feet to twenty feet for isolated words.

Case XI.—Dr. W. H., of Iowa, aged thirty-two. Chronic attic suppuration; sole perforation in membrana flaccida; hearing very poor. August 10, 1892, membrana and malleus were excised; body of the incus was found adherent to the head of the malleus; stapes plainly visible and movable with probe. Great improvement in hearing—from one foot to fifteen feet for a whisper; diminution of discharge.

Case XII.—Henry T., of England, aged thirty. Chronic suppuration of the atrium; sole perforation in the membrana tensa. August 13, 1892, excision of the membrana and malleus; incus not found. Reaction with acute suppuration; partial regeneration of membrana and less discharge by August 13; hearing unchanged.

Case XIII.—Edith H., of Dauphin County, Pennsylvania, aged sixteen. Chronic purulent otitis media, left ear, for five years; hearing reduced to four feet; scanty, offensive discharge; large perforation in the membrana flaccida; malleus head and neck visible. November 30, 1892, enlarged the perforation downward into membrana vibrans; attic and atrium found in free communication; pus in the latter cavity; large piece of cholesteatomatous matter removed from the aditus. After a horseshoe incision about the manubrium, it was seized with delicate forceps and removed alone, as it was already detached by necrosis from the rest of the malleus; malleus neck and head found adherent to inner surface of tympanic plate of the squama; when removed by means of the incus-hook the body of the incus was found attached to the head of the malleus by dense fibrous bands. Hearing improved at once to ten feet; the discharge greatly diminished in quantity and improved in quality in six months; case then withdrew from further observation.

Case XIV.—Harry P., of Philadelphia, aged nine. Chronic purulent otitis media, right side, for several years; hearing very bad; large posterior perforation in the membrana tympani; polypi. January 3, 1893, enlarged the perforation upward and backward; removed two polypi from region of aditus with an incus-hook; after this clearance a central perforation was found in the membrana flaccida, hitherto unseen and undiscoverable by probes because of patient's great sensitiveness to touch in this region; ligaments of malleus cut and bone removed; then only the long process of the incus was hooked out with incus-hook; nearly the entire head of malleus was destroyed by necrosis; its neck and short process covered with fibrous bands. This case has grown slowly better under the use of alcohol instillations and syringings. The only gain seems to be better drainage from the attic and antrum, and within a year almost entire freedom from formation of polypi in the posterior part of the attic.

Case XV.—Mrs. P., of Philadelphia, aged forty. Chronic purulent otitis media, left ear; neoplastic diaphragm inserted near annulus tympanicus with central perforation; no trace of malleus. Excision of neoplastic membrana; no trace of incus; stapes in position. Cessation of discharge; great improvement in health and hearing (from one foot to six feet); regeneration of membrana, without perforation, in two months; remains well at present time.

Case XVI.—February 16, 1894. Chas. M., aged fifteen. Chronic purulent otorrhea, left ear, for many years; parents died of phthisis. Excision of thickened membrana and necrotic malleus; head of latter half destroyed; no incus found; attic filled with synechiæ and cholesteatomatous débris. Lessening of discharge and improved condition of attic; hearing unchanged.

Case XVII.—March 7, 1894. Walter S., aged twenty. Copious chronic purulent discharge from the right ear (attic and atrium). Under ether removed two polypi and remnant of membrana and malleus; head of latter and part of the neck entirely eroded. Nearly total cessation of discharge in a month. Patient passed from observation.

Case XVIII.—March 16, 1894. Mr. P., of New York, aged forty-seven. Chronic purulent discharge from left ear, with large perforations in the membrana flaccida; membrana tensa and manubrium intact, and forming a pocket for pus. Excision. Entire cessation of inflammation and discharge in a year and a half; deafness unchanged.

Case XIX.—October 15, 1894. Mrs. A. K., aged twenty-one. Chronic purulent otorrhea since childhood; attic and antrum perforation; membrana destroyed; malleus and incus bound together by synechiæ; excised under ether. Hearing improved at once, and total cessation of discharge in two months after operation, and result has remained permanent.

Case XX.—November 2, 1894. Addison M., seventeen years old, a negro. Chronic purulency of attic and atrium, and large polypus in the right ear. Removed under ether. Nearly total cessation of discharge in two months; hearing unchanged.

Case XXI.—November 2, 1894. Left ear of the above-named patient. Similar lesions. In the same etherization, removed remnant of malleus embedded in polypoid membrana. Nearly total cessation in two months; hearing unchanged.

Case XXII.—November 12, 1894. P. R., aged thirteen. Chronic otorrhea for four years; mastoid abscesses and operation by another surgeon several years previous to my first inspection of case; continuance of otorrhea; membrana largely perforated. Under ether, excision of diseased membrana and malleus. Total and permanent cessation of discharge in two weeks after operation; hearing unchanged.

Case XXIII.—March 6, 1895. Boy six years old. Chronic otorrhea, right ear, for some years. Excision of membrana and malleus; large perforation through upper posterior wall of auditory canal into antrum; large cholesteatomatous masses removed from attic and antrum; finally opened the mastoid cells to tip of process, and removed foul débris from mastoid cavity, lying below line of perforation in canal wall into the antrum. Entire recovery in a month.

Case XXIV.—June 27, 1895. Mr. F. L., aged forty. Chronic otorrhea, right ear, all his life; remnant of membrana retracted and malleus drawn up into empty attic; no incus visible. Excision of membrana and malleus; latter eroded at tip of handle and rough over entire surface. Total cessation of discharge in two months; hearing improved.

Case XXV.—February 29, 1896. Lizzie B., aged twenty-one. Chronic suppuration of the attic; complains of tinnitus and vertigo; large perforation in the membrana flaccida; neck of the malleus visible; membrana tensa drawn

inward. Excision of remnant of membrana and malleus; head of the latter destroyed; no incus found. Cessation of discharge in a month and relief of vertigo.

CASE XXVI.—Mrs. G., of Massachusetts, aged forty. Chronic attic suppuration for many years. October, 1896, excision of adherent and partly necrosed head of malleus. Cessation of discharge and improvement of hearing from one foot to six feet.

CASE XXVII.—Master A., aged seventeen. Chronic attic suppuration several years; large perforation in the membrana flaccida. November 27, 1896, excision of the membrana tensa and the handle of the malleus; cavity of tympanum filled with granulations. Nearly total cessation of the discharge in four months, under mopping with alcohol and acetanilid (18 per cent. solution); hearing unchanged.

CASE XXVIII.—Mrs. F., aged forty. Chronic attic suppuration in the left ear; perforation in the membrana flaccida, with neck of malleus visible. December 10, 1896, membrana tensa and handle of hammer removed; atrium free from disease. Marked lessening of the discharge in two months; deafness unchanged.

CASE XXIX.—December 29, 1896. Mr. M. J. K., of Clearfield County, Pennsylvania, aged thirty. Chronic attic suppuration since typhoid fever six years previous. Excision of membrana tensa and handle of the hammer; atrium free from disease; copious discharge from region of attic and aditus. Lessening of discharge; deafness unchanged as yet; still under treatment.

CASE XXX.—March 27, 1897. Louis L., of Cambria County, Pennsylvania, aged sixteen. Chronic attic suppuration for eight years; large perforation into attic; membrana tensa and handle of malleus intact; scanty, thick and offensive discharge from attic. Excision of membrana and manubrium; head of hammer eroded; atrium free from disease. Cessation of discharge and loss of offensive odor under bichloride syringing (1:5000) for four weeks; *accidental introduction of irritant into recently treated drum-cavity, followed by renewal of discharge.* This case is still under treatment, and is counted among those in which discharge still continues.

In every instance the operation has been followed immediately by a lessening of the discharge, the latter becoming less purulent and offensive and more mucous in its quality. Total cessation of the discharge, with cicatrization of the fundus, has taken place in fourteen cases: four times in the course of two weeks, three times in one month, five times within two months, once in a year, and once in a year and a half. The *ultimate* results in several of the earliest cases are not known, as they have passed from observation. Two cases are still under treatment, as they have been recently operated upon,—viz., Cases XXIX and XXX.

The hearing has improved in eighteen cases, has remained unchanged in eleven cases, in which the atrium was the chief seat of disease, and in one case, a child of six, the hearing was unrecorded.

The attic alone was affected in nine cases, the atrium alone in seven cases, and the attic and atrium together in fourteen cases.

Marked ear-vertigo was present in two cases, due in Case IV., in my opinion, to an irruption of the purulency into the vestibule through the foot-plate of the stapes. In Case XXV. the ear-vertigo was probably due to irritation about the stapes. Both cases recovered soon after the operation.

Alcohol instillations or alcoholic solutions of boric acid or acetanilid have proved most efficient in the after-treatment so long as any granulations were present. After these had ceased to form and the mucous membrane became smooth, a solution of carbolic acid in water (2½ per cent.) or a solution of bichloride (1 : 6000) acted best. In some instances in which the discharge had become slight, simply mopping the fundus of the canal with absorbent cotton, slightly singed, seemed to perfect the cure.

Case XIV. has proved the most obstinate in discharge. However, under the persistent use of alcohol syringing at home, once a day at first, later every other day, alcohol moppings, and now and then a cautious application of chromic acid by my hand, granulations and small polypi have ceased to form.

When total cessation of the otorrhea has occurred, it may be concluded that the purulent disease was limited to the drum-cavity and, possibly, the aditus. In those cases in which the discharge has not yet ceased, it may be concluded that the disease has extended to parts beyond the tympanic cavity. These parts having been made more accessible to treatment and drainage from them having been improved by the operation, ultimate recovery may be hoped for in time. As has been stated, entire recovery has been delayed as long as eighteen months (Case XVIII.). As long as the discharge diminishes and no symptoms of extension to the mastoid or cranium appear, ultimate recovery may be hoped for.

No case has been made worse by the operation, not even temporarily, but, as stated already, every case has been made better, in varying degrees, by the operation. This fact proves that so-called "excision of the ossicula" in chronic purulency of the ear, by perfecting the drainage from the middle-ear cavities and facilitating antisepsis of these parts, *prevents* mastoid caries, sinus-phlebitis, cerebral abscess, and pyemia, and should, therefore, precede any operation on or through the mastoid simply for the *cure* of chronic purulency of the middle-ear spaces. Mastoid trepanation for the cure of chronic purulency, furthermore, will not succeed if the diseased ossicles are not removed at the same time, whereas purulency of the middle ear that has continued after a mastoid trepanation undertaken for its relief, without excision of the ossicles, will cease as soon as the latter operation is performed, as exemplified in Case XXII.

The results of excision of the necrotic ossicles in chronic purulent otitis media may be summed up as:

1. Prompt lessening of the discharge in all cases.

2. Ultimate cessation of the discharge and cicatrization of the fundus in nearly one-half of the cases, as observed so far.

3. Arrest of the advance of caries and necrosis in the drum-cavity, aditus, antrum, and mastoid cells, thus lessening the liability of the occurrence of intracranial lesions of otitic origin.

4. Improvement in hearing in more than half the cases.

5. Marked amelioration in the general health, especially in those cases presenting symptoms of slight septicemia from the chronic purulency.

REPORT OF A CASE OF INTUSSUSCEPTION OF THE ILEUM IN AN ADULT, AND OF A CASE OF INFLAMMATION OF LONG BONES AS A SEQUEL OF CHOLERA.[1]

BY G. H. RICHARDSON, M.D.,
Mandalay, Burmah.

CASE I.—Putrosammy, aged thirty-six, Hindustani, camp-follower in the Fourth Bengali Infantry. Gave a history of having chronic diarrhea of eight weeks' duration. He had been very much exposed and on a diet of split peas and rice for some time. Admitted to the hospital suffering from dysentery of severe type.

Two days after admission he complained of severe pain in right inguinal region, which was somewhat swollen and tender. A perceptible tumor was noticed, which was movable. He received the usual routine treatment by salines and injections. On the evening of the day following he died suddenly in a state of collapse after suffering severely.

The post-mortem, which was of extreme interest, I was able to witness through the kindness of Surg.-Capt. Pridmore, medical officer in charge.

Body of man about five feet four inches, very much emaciated, abdomen slightly swollen. A tumor, size of large orange, could be felt in right inguinal region.

On opening abdomen the visceral and parietal peritoneum was found coated with dirty lymph, with contents matted together yet easily separated. Fecal matter and pus were found free in abdominal cavity.

The intestines were removed *en masse* and then dissected. No vermiform appendix could be found. The large mass noted on external palpation was found to be the head of the colon. The tumor was cut away from the remaining structures and carefully opened. The ileum was found invaginated into the caput coli for the distance of eight inches, and lay in the colon, a convoluted mass, covered with a dark, adherent slime. Approximately fourteen inches of the small gut lay in this mass, and it seemed that a part of the colon itself was involved, as the vermiform was found along with the mass and adherent to it. About four inches from the lower portion of the tumor, a dark necrotic area was found, in which a perforation was distinctly noted. The peculiar points noticed were that the ileum involved in the intussusception seemed patulous, and that the mass itself was not adherent to the lining mucous membrane of the large intestine.

The colon in its entire length was studded with ulcers in different stages of development; none were, however, of particular interest to warrant description. Spleen enlarged and soft. Liver congested and covered with lymph. Other organs of no pathological interest.

CASE II.—This case I saw through the kindness of the Civil Hospital Assistant in Maymyo, who asked me to study it with him.

Subluah, a native of India, aged thirty, was admitted to cholera-camp on April 12, 1897. He was one of a party of eight men who came from Mandalay, distant about forty miles, and on the way they drank of a small stream in which a victim of cholera had been thrown (as was afterwards learned). Six men were

[1] Read before the Judson Daland Medical Society of the University of Pennsylvania, November, 1897, by Dr. H. B. Mills, of Philadelphia.

taken sick, four of whom died after from two to four days' illness. The two patients who recovered were treated with one twenty-fourth of a grain of corrosive sublimate every two hours, pills of lead and opium after each movement, and large rectal injections. Subluah left the hospital twelve days after his admission, and walked the distance of three miles to the town.

Three days after his discharge he came again to the hospital, suffering with severe pain in left knee and leg. He had a slight rise of temperature, and the doctor placed him on the alkaline treatment for rheumatism. After the case had been treated for ten days, I saw him for the first time. He was then very much emaciated and pale, cheeks and eyes sunken, a facial expression denoting pain. Motion of any portion of the body was attended with pain in the joints involved. Temperature normal, sometimes below 98° F. Pulse weak and feeble. No heart or lung disease. Appetite poor and bowels constipated. There was no marked swelling of any joint, and no localized redness or heat. The pain in joints seemed to be constant, of a boring character, increased on motion. The head of the left tibia and the right humerus seemed particularly painful. Along the sternum were found several nodes, which, when tapped slightly, gave pain. Slight pressure of the bones along their course (not at the joints) gave pain. The man was so thin that this could easily be done without pressure on muscles. The lower limbs were more tender than the upper extremities. The application of heat was the only remedy which seemed to afford relief, although phenacetin given at night gave him a few hours' sleep. He was placed on syrup of iodide of iron (fifteen drops q. i. d.), and upon my departure seemed to be improving in general health, and the pain somewhat lessened. There was no history of syphilis, and the case has been under constant observation for four weeks without giving a rise of temperature that would indicate rheumatic fever.

A REVIEW OF THE LITERATURE OF KOCH'S TUBERCULIN R.

BY J. DUTTON STEELE, M.D.,
Associate in the William Pepper Laboratory of Clinical Medicine, Philadelphia.

It is now over half a year since Koch's original article appeared in which he announced the discovery of tuberculin R, and his experiments by which he showed the possibility of producing by its use immunity in the guinea-pig against the tubercle bacillus and its products. Many articles have since appeared, and we may conclude that the first period of this literature is finished; by this is meant that in which the results of numerous series of observations are recorded. From these observations conclusions may be drawn as to the immediate effects of tuberculin R upon the general system and upon various tubercle foci already existing in the body.

H. Buchner claims for his brother Edward Buchner priority in the idea of mechanically breaking up tubercle bacilli for the purpose of facilitating their absorption. He published his article with an account of his experiments in 1893. He states that he is able to pulverize the tubercle bacilli in their moist state by grinding them with sand, and thus avoid the

danger which is incurred when they are powdered in a dry state. For an abstract of Koch's original article the reader is referred to the INTERNATIONAL MEDICAL MAGAZINE for July, 1897. The material is obtained from the laboratory in its concentrated form, and diluted to a proper strength by glycerin or a normal salt solution; the latter inflicts less pain. In general, the commencing dose was $\frac{1}{500}$ of a milligramme, which Koch says should be doubled every second or third day. Most observers, however, have found that this is too severe, and increase the dose much more slowly and at intervals determined by the amount of reaction. The maximum of 20 milligrammes is seldom reached, because of excessive reaction or lack of opportunity to finish the cure. Bussenius gave one patient 40 milligrammes and several others 20 milligrammes as a maximum dose. The maximum in other cases varied from 6 milligrammes to 4 milligrammes. The time of the "cure" varied from sixty-five to seventy days. Bussenius reports four cases who finished the cure, that is reached the maximum dose of 20 milligrammes. These cases received large doses of the old tuberculin without reaction. Von Neucki, v. Maczewski, and v. Logucki found in freshly opened bottles of tuberculin R live pneumococci, streptococci, staphylococci, and several varieties of moulds and yeasts; they also found a few tubercle bacilli in two cases. The specimens obtained in bottles with cork stoppers were much more likely to be contaminated. Trudeau and Baldwin found that all of twenty-eight bottles with cork stoppers and seven out of forty-eight bottles with glass stoppers contained yeast-like growths, which were not, however, pathogenic to guinea-pigs. One or two bottles contained living tubercle bacilli. Bussenius, however, examined many specimens, and found them sterile and free from tubercle bacilli.

The injections are given with a hypodermic syringe under strict aseptic directions. In a majority of cases there is decided local reaction about the point of injection. But few abscesses are reported, but in several series such occurred, in one of which the pus was examined for tubercle bacilli without result (Rumpf). Several observers report cases in which an old point of injection became inflamed after a subsequent injection in an entirely different part of the body. Infiltration and redness lasted but a few days. Urticaria was observed in one case by Bruno-Leick, and erythema in two cases. The injections were given in the back or the buttocks. The different outputs of the material show great difference of strength. Bussenius attributes much of the difficulty of preventing excessive reaction to this fact. Thus, a man may reach a large dose without reaction and react strongly at the next dose. The output of June 11th seemed particularly toxic (Bussenius, Van Hoorn, and Wörner). Bussenius and Baudach complain of the variability of the same specimen in the same patient. It is difficult to explain the irregularity and variability of the reaction upon any other ground. Kraatzer thinks that there is an idiosyncrasy to T R.

Koch says that there should be no reaction greater than .5° C. Most

observers, however, report much greater rises in temperature. The highest variation occurred in a case of Bussenius's series, and the patient showed a temperature of 40° C. The fever usually appears two hours after injection and lasts about six hours. Bruno-Leick doubts whether much of this fever, especially when the injection is given in the evening, is not due to the course of the disease. In no case is frequency of pulse out of proportion to the fever reported. Symptoms of general nervous disturbance, headache, dizziness, chilliness, pain in the back and limbs, occur usually at the same time as the fever, but may not do so. Reaction in the urinary tract, as hematuria and albuminuria, is usually absent. Gerber reports an exacerbation in the case of chronic nephritis during the "cure." Isolated cases of albuminuria are reported by a few observers. Diarrhea was noted by Schultze and Herzfeld. Rumpf reports a case in which but trifling reaction occurred and a dose of 20 milligrammes was reached without reaction; however, four days later intermittent fever commenced, with an evening temperature of 39° C. The point of the injection became very much inflamed and an abscess formed. The pus was examined for tubercle bacilli without result. Rumpf considers this to be an evidence of accumulative action, but it would seem without good reason; it is much more likely that there was a pyogenic inflammation through contamination of the material or imperfect asepsis, and that the febrile process was dependent upon the abscess. The lymph glands in the neighborhood of the injection occasionally enlarged; the enlargement, however, was temporary, and no case was reported in which they broke down.

There was no evidence of reaction in the digestive tract: the appetite usually remained about the same as when the "cure" was commenced. In the early stages there was usually a gain in body weight, in the latter stages a loss. Often the weight remained stationary throughout the "cure," and the statistics on the subject are so indefinite as to be of little value. Bussenius thinks that a loss in weight during the latter half of the cure is an indication that the doubling of the dose causes too great a drain upon the strength of the patient.

Koch's directions as to the character of cases to be chosen have been generally followed. Such cases are those in which the range of the evening temperature does not exceed 38° C., and in which there is no evidence of infection by the pyogenic micro-organisms.

All observers agree that it is too soon to state positively the effect of the treatment upon tubercular foci in the lungs. As Koch has asserted, the sputum, the râles, and number of bacilli usually increased at first, and then diminished. The physical signs, as a rule, remained about the same, although a few cases appeared to be improved and a few grew worse.

Kraatzer reports a series of eight cases, in five of which there was decided diminution in dulness, râles, and bronchial breathing, but no improvement in one and loss in two. He brings forward nothing to prove that change was due to tuberculin R.

In lupus injections gave almost invariably good results. Doutrelpont reports fifteen cases and Bussenius three, in all of which there was marked improvement during the course of injection. Several of them, however, had been previously cured by the old tuberculin, and it remains to be seen whether the effect of the new remedy is any more permanent.

Seligman reports a case of tuberculosis of the genital organs, in which there was discharge from the cervix of a purulent material which contained tubercle bacilli. The same case showed abdominal tumors diagnosed as double pyosalpingitis. During treatment with T R the discharge stopped, the tumors almost disappeared, and the lupus healed. This is one of the most important observations that has yet been made, and one of the few cases in which the immediate effect of the T R has been undoubtedly beneficial. It is hard to see how the healing of the areas of lupus under the influence of T R differs from the good results produced by the old tuberculin. Van Hoorn reports ten cases of lupus, all of which improved, with almost no local reaction. He also reports a case of tubercular disease of the testis and epididymis which did not improve.

Herzfeld reports seven cases of laryngeal tuberculosis treated by T R. Two improved, four grew worse, and one remained unchanged. The improvement was not great, and much benefit was afterwards derived from local treatment. Bussenius states that the fears of a reactionary edema of a laryngeal ulcer sufficient to cause obstruction are unfounded.

Müller reports two cases of otitis media treated by tuberculin R. One was a patient with tuberculosis of the lung and tubercular otitis of three months' standing. After four months' treatment with T R, miliary tubercles appeared in the tympanum of the sound ear, and the ear commenced to discharge; tubercle bacilli were found in the pus. He discusses the responsibility of the T R for the condition, and suggests that it may have caused greater activity of the tubercle bacilli in the tubercular process in the lung and free entrance into the blood-stream. However, as the lining of the middle ear was simultaneously affected, he considers it much more likely that the source of the inflammation was the entrance of the bacilli through the eustachian tube during coughing. He mentions the possibility of the injected material carrying the inflammation. In neither of the cases did benefit result from the treatment. Slawyk reports two cases of tuberculosis in children treated with T R. They were aged eight and one-half years and eight years respectively. Both had tuberculosis of the lung and some lymphatic involvement; the first had an enlarged spleen. The older, and much more healthy child, reacted seriously, with fever, and had several relapses. That these attacks were not caused by the accidental entrance of the needle into a vein is shown by the fact that they occurred in all instances from twenty-two to twenty-four hours after the injection. Both children seemed to improve slightly, and the enlarged spleen and enlarged glands diminished in size. The dose for children must be very small, and is to be increased much more cautiously than in

adults; the maximum should never exceed two milligrammes. Baudach mentions a case in his series in which an ischiorectal abscess and a sinus leading to a tubercular gland in the neck showed signs of activity soon after the "cure" was commenced, and healed before it was completed.

The following conclusions may be drawn:

1. The new preparation if uncontaminated does not seem to be more harmful than the old tuberculin if very carefully given. The dosage suggested by Koch is probably too severe. Much is left to be desired in the preparation of the material. In its present form it is usually contaminated. The greatest element of danger is the possibility of the presence of living tubercle bacilli. It may also contain streptococci, diplococci, staphylococci, and various saprophytic bacteria. Certain outputs of the substance are clearly stronger than others and more likely to cause serious reaction.

2. The injections are accompanied by much discomfort to the individual. The point of entrance of the needle usually becomes the seat of considerable inflammatory reaction and occasionally of abscess formation. Much of this may be accounted for by the contamination of the preparation or faulty asepsis in its administration; but, even in the absence of the former and with extreme care in the latter, as in the series reported by Bussenius, some infiltration may occur. Very marked systemic reaction occurred in some part of the course of injection, but there is a reasonable suspicion that this may be caused by the apparent variation in strength of the preparation. It is possible that, if this uncertainty is overcome, immunity against the products of the microbe may be reached without undue reaction.

3. The immediate effects of the preparation upon existing lesions of the lung, larynx, bladder, and middle ear are too indefinite to admit of any certain opinion being formed concerning them. In lupus, in various suppurating tracts, and in one noticeable case of tuberculosis of the uterus and its appendages, the remedy seemed to be of value; but whether of greater worth than the old tuberculin can only be determined by longer observations.

4. Koch's experiments upon guinea-pigs apparently established the fact that in them an immunity against both the bacteria and their products could be obtained, and, inasmuch as several patients after completing the course of injections stipulated by Koch received large doses of the old tuberculin without reaction, it would seem as if an immunity against the products of the bacilli could be produced in man. Whether such individuals possess also an immunity against the bacteria themselves, and therefore are protected against reinfection, must be settled by observations extending over a longer period of time. The observation of Baudach in this connection is pertinent: "The question of the production of immunity is unsettled. If there is none produced, then the only point of difference between tuberculin R and the old tuberculin is the greater toxicity of the former." The class of cases in which the use of the remedy is justifiable is naturally very limited.

BIBLIOGRAPHY.

H. Buchner: Zur Robert Koch's Mittheilung über neue Tuberculin Präparate. (*Berliner klin. Wochenschrift*, 1894, No. 15.)

L. von Neucki, M. von Maczewski, und A. von Logucki: Bermerkungen über die Bereitung und Anwendung des neuen Koch'schen Tuberculins. (*Therapeutische Wochenschrift*, 1897, No. 3, and *Presse méd.*, 1897, No. 46.)

G. Schröder: Über das neue Tuberculin. (*Münchener med. Wochenschrift*, 1897, No. 29.)

Bussenius: Einige Mittheilungen über die bisher bei Anwendung des Tuberculin R. gesammelten Erfahrungen. (*Deutsche med. Wochenschrift*, 1897, No. 28.)

Wörner: Über das TR Tuberculin. (*Ibid.*, No. 30.)

Doutrelepont: Kurze Mittheilung über die bisherigen Erfahrungen bei der Anwendung des neuen Koch'schen Tuberculins. (*Ibid.*, No. 34.)

J. Herzfeld: Das Tuberculin R bei Larynxtuberculose. (*Ibid.*)

Baudach: Vorläufige Mittheilungen über Anwendung des neuen Koch'schen Tuberculins. (*Ibid.*)

B. Leick: Über die in der medicinische Klinik mit dem neuen Tuberculin Koch bisher erzielten Resultate. (*Ibid.*)

de la Camp: Zur Behandlung der Lungentuberculose mit besonderer Berucksichtigung der Wirkung des Tuberculin R. (*Ibid.*)

R. Müller: Ein Fall von Erkrankung an akuter tuberkulöser Mittelohrentzundung während einer Kur mit neu Tuberculin. (*Ibid.*)

F. Schultze: Kurze Mittheilung uber das neue Koch'sche Tuberculin. (*Ibid.*, No. 28.)

Slawyk: Die bisherigen Erfahrungen mit Tuberculinum R auf der Kinderstation der Charité. (*Ibid.*, No. 30.)

L. Seeligman: Über einen Fall von Genital- und Hauttuberculosis behandelt mit Tuberculin R. (*Ibid.*, No. 30.)

W. van Hoorn: The New Tuberculin R in the Treatment of Lupus and Vesical Tuberculosis. (*Ibid.*, No. 35.)

P. Kaatzer: Further Observations upon the Tuberculin Treatment. (*Ibid.*)

J. Petruscky: The Koch Treatment of Tuberculosis. (*Ibid.*)

W. Pfeifer: Kurze Mittheilung über die seitherigen Erfahrungen mit dem neuen Koch'schen Tuberculin. (*Zeitschrift f. praktische Ärzte*, 1897, No. 15.)

V. Jez: Über das neue Tuberculin (TR) Koch's und über die Behandlung der Lungentuberculose mit demselben. (*Wiener med. Wochenschrift*, 1897, No. 31.)

Maragliano: A proposito della nuova tuberolina di Koch. (*Gazz. degli ospedali e delle clin.*, 1897, No. 81.)

Trudeau and Baldwin: The Need of an Improved Technique in the Manufacture of Koch's TR Tuberculin. (*Medical News*, August 28, 1897.)

L. Spengler: Ein Beitrag zur Tuberculinbehandlung mit TR. (*Deutsche med. Wochenschrift*, 1897, No. 23.)

Robert Koch's neue Tuberculin Präparate. (*Allg. med. Centralblatt und Zeitung*, 1897, No. 33.)

Peron: À propos de la nouvelle tuberculin de Koch. (*Presse méd.*, 1897, 173.)

Moeller: La nouvelle tuberculin de Koch. (*Rev. méd. Louvain*, 1897, XV. p. 343.)

Proca: Nota asupra bacteriler pe care le continue nova tuberculina. (*Romania med. Bucuresci*, 1897, V. p. 243.)

Von Kuch: Professor Koch's New Tuberculin. (*New Orleans Medical and Surgical Journal*, 1897, I. 17.)

J. McFarland: Antituberculin. (*Journal Am. Med. Ass'n*, 1897.)

REVIEW OF MEDICINE.

MEDICINE.

Polymyositis Acuta and Acute Articular Rheumatism. (*Deutsche med. Woch.*, April 8, 1897.) By Dr. H. Risse.

The patient, a small but very stout man, thirty-five years of age, had suffered for some time from a weeping eczema of the right hand. After a sprain he had a slight attack of acute articular rheumatism that lasted two or three weeks, but presented no complications. In the following winter he had two attacks of the same disease, and one of the servants of the house had a similar attack. In the summer, after a severe journey, he was suddenly attacked with a painful swelling of the right ankle-joint. A few days later very severe pains commenced in the right leg, which were accompanied by acute swelling of all the muscles; this swelling increased and the skin became edematous, so that the limb was nearly twice as large as the other. Later this extended to the muscles of the thigh, then involved the left leg, along which the disease extended to the muscles of the abdomen, and, as hiccough was a prominent symptom for a short time, probably also to the diaphragm. During the defervescence there was a slight degree of albuminuria. After cure, which occurred in the course of two months, there was slight atrophy of the muscles that had been affected, but their power remained good. The author very naturally includes his case among the "acute myosistides" which are caused by the poison of acute articular rheumatism.

SAILER.

Changes of the Heart resulting from Baths and Gymnastics as shown by the Röntgen Rays. (*Deutsche med. Woch.*, April 1, 1897.) By Theodore Schott, M.D.

Not entirely satisfied with the results of percussion and palpation, the author, in order to demonstrate the diminution that takes place in the size of the heart after treatment with cool saline baths and passive gymnastics, has undertaken to photograph a number of cases with the Röntgen rays. The vacuum tube is always placed at a certain distance from the patient, and it is possible therefore to express the result in centimetres. Unfortunately, the shadows of the sternum and the vertical column prevent the measurement of the vertical diameter. In two cases, one a boy of $8\frac{1}{2}$ years suffering from insufficiency of the mitral valve, the greatest transverse diameter of the heart diminished from 12.3 cm. to 11.2 after passive movements. The other, a girl of 14, remained for ten minutes in a saline bath at a temperature of 31°. The greatest diameter diminished in this case from 11.1 cm. to 10.3 cm.

SAILER.

Contributions to the Behavior of the Respiratory Apparatus in Epileptic Convulsions. (*Deutsche med. Woch.*, October 21, 1897.) By Dr. Bressler.

The author has observed that epileptic patients frequently complain of pain or oppression in the side, breast, or back after their attacks. Suspecting that there might be some morbid basis for this condition, he repeatedly examined such patients, hoping to find either pleuritic friction or localized râles; but the results were always negative. He is, therefore, compelled to believe that the violent movements and the increase of blood-pressure during the convulsive attack have caused petechial hemorrhage beneath the visceral pleura. He admits that to prove such an assumption much material from autopsies would be necessary, and this he has not been able to obtain. Nevertheless, in all cases that he has seen since his attention has been directed especially to this point, he has found changes that indicate either recent or old subpleural hemorrhage. Indeed, hemorrhage has been found not only in the pleura, but also in the pericardium and even beneath the capsule of the kidneys. He has observed, moreover, that these hemorrhages occurred also in cases in which death was due apparently to paralysis of the respiratory centre without convulsive movements. An additional agent in their production may also be compression of the aorta, due to violent contractions of the diaphragm.

SAILER.

THERAPEUTICS.

On Immunization and Serum-Therapy in Staphylomycosis. (*Beiträge zur klin. Chirurgie*, Vol. XIX., No. 2.) By Wm. Peterson, M.D., Assistant in Professor Czerny's Clinic.

The author begins his instructive and scholarly paper with a critical review of the work which has been done by others in this field, and concludes that here, as in streptomycosis, the results have been variable and contradictory, and that the methods used were unsystematic, unreliable, and uncontrollable. He then gives a long series of experiments of his own, and finally his conclusions. The first three questions of importance are (1) Are we dealing with an infection or an intoxication? (2) Does convalescence from the disease confer a natural immunity? (3) Can antitoxic bodies be found in the blood after convalescence? In reference to the first question the sum of our experience teaches us that staphylomycosis is neither a pure infection nor a pure intoxication, but lies between these two extremes, being toxic as well as infectious. There are cases of staphylomycosis which behave clinically like a pure infection, while, on the other hand, a local abscess may cause fatal intoxication. Generally the infection is of mixed toxic-infectious type. It is as yet impossible to answer the second question with absolute certainty; experience seems to show that a certain degree of immunity exists during a limited time. The third

question, whether antitoxic bodies are present in the blood, can be answered in the affirmative. Formerly immunity and the presence of these bodies were considered identical, but we now know that, while this is true in the majority of cases, the former may exist without the latter. Rabbits were inoculated by the author with the serum of patients convalescent from osteomyelitis, which proved to be of considerable antitoxic potency, but serum taken from the same patients three months later was devoid of antitoxic properties. Experiments with Viquerat's serum gave negative results. The author calls attention to the importance of obtaining the pure toxins of this organism and to the difficulties confronting the investigator. While the toxins of diphtheria and tetanus are quite characteristic in their physiological reactions, those of the *Staphylococcus pyogenes* are not, their power of causing suppuration being shared by those of many other organisms. Reasoning from the behavior of other organisms, Peterson would consider a substance a staphylococcus toxin (1) if it is the most effective in conferring immunity and (2) if the poisonous effect of a substance is lessened or neutralized by immunization with another substance. In the absence of a more exact knowledge of these toxins, the author conducted his experiments along the following lines: (1) attempts at immunization with sterilized cultures, (2) attempts at immunization with filtrates of staphylococcus cultures, (3) attempts at immunization with attenuated cultures and combination of this method with (1) and (2). The first series was made by Reichenbach; the result showed the attainment of a considerable degree of immunity; the serum was effective against the twofold to threefold fatal dose of the sterilized culture, but the blood of the animals lost its antitoxic properties in thirty-six days and its immunity in seven months. For the experiments with filtrates it was found necessary to condense them *in vacuo* to one-tenth their volume, in order to obtain the required degree of toxicity. With the streptococcus as well as staphylococcus the author found that the toxicity of the filtrate was never in proportion to the virulence of the culture itself: the latter may be very great (1 : 4 : 20 : 100), while the former in three weeks' cultures was only 1 : $1\frac{1}{2}$: 3 : 5. The results with this substance were entirely negative as regards immunity as well as antitoxic power of the serum. In the third series attenuated cultures were used, and here the author calls attention to the impossibility of maintaining cultures of this organism at a standard strength, so that for each series fresh check animals had to be used to test their virulence. Cultures two days old were used; the animals inoculated were white mice, rabbits, and goats. Only the serums of the two last mentioned were used. The cultures and the serum were injected into the peritoneum, the veins and muscles, and subcutaneously; but, owing to the uniform conditions of absorption, the former method was employed exclusively for testing the serum. At first the cultures were attenuated with trichloride of iodine; later on it was found that simple dilution answered just as well. In addition it was noticed that better results could be obtained if the animals had been sub-

jected to preliminary inoculations with sterilized cultures. Animals so treated proved refractory to the fatal dose, but not to twice that quantity. It was impossible to increase the degree of immunity, even when the inoculations were continued four months longer. In another series thirty rabbits were used; these he divides into three groups. In group one the rabbits were injected with small and very slowly increasing doses of the cultures. In group two very large doses were used, and repeated when reaction was over. This method killed many animals, but was very effective. Group three was first inoculated with sterilized cultures and then treated substantially as in group two. In this way a more potent serum was produced. The results in groups one and two were variable, inasmuch as the potency of the serum of the different animals varied within wide limits. The serum exerted its greatest immunizing power when the difference of time between inoculation and injection varied only a few hours. The serum obtained from group three was by far the most potent. In a further series the author used goats, in the hope of obtaining a larger quantity. Some of the goats produced a serum of considerable immunizing power; its potency was greatest from twelve to fourteen days after an intense reaction. The question whether the serum exerts an antibacterial or antitoxic action, or both, is difficult to answer. *In vitro* the cultures grew just as well in the presence as in the absence of the serum; but, as we know from cholera, this is a point of minor importance, since antibacterial substances may be formed in the organism in the presence of the serum. While the immunizing power of the latter was considerable, its antitoxic potency was very weak. It required from one-hundredth to one two-hundredth of the body-weight of the animal to protect it against the minimal fatal dose of the culture. Agglutination, as in Widal's test for typhoid fever, was never observed. The author concludes that the action of the serum is principally antibacterial and in a slight degree antitoxic; he believes that with a proper selection of animals, and especially with chemical isolation of the antibodies in the serum, a concentrated and effective substance for the treatment of staphylomycosis may be obtained.

MUEHLECK.

The Action of the Serum of Marmorek upon the Streptococcus of Scarlet Fever. (*Comtpes Rend. de la Soc. de Biol.*, February 19, 1897.) By Mery and Lorrain.

Seven cultures of streptococcus were obtained from cases of scarlet fever, three being taken from the throat, two from the urine, one from a suppurating lymph-gland, and one from the blood. All these were morphologically identical, and were large individuals forming long chains, frequently interlaced, and when inoculated causing local joint diseases, even when introduced beneath the skin. The authors believe that in scarlet fever an ordinary streptococcus infection does not occur, and that the organism, which they found in the throat, blood, pus, and urine of the patients,

differs from the *Streptococcus pyogenes*. All six of these cultures were absolutely refractory to the serum of Marmorek, and, as the action of the serum is very different upon the organisms supplied by M. Marmorek, the authors conclude that the distinction between the two forms is specific. This opinion was confirmed by the results of the experiments with the seventh culture, one obtained from the throat. In this the individuals were small and the chain short, with no apparent interlacing. It was found that the serum of Marmorek was capable of retarding death very considerably, even when three hundred times the lethal dose had been employed.

SAILER.

Experiments with Inoculation against the Bubonic Plague. (*Deutsche med. Woch.*, April 8, 1897.) By Alex. Lustig and G. Galliotti.

The authors experimented with Yersin's method of producing immunity, and did not find it very satisfactory, as the animals so treated, although showing resistance to a certain extent, usually succumbed in the course of time. They then devised a plan of their own, in which cultures grown upon a large agar surface were scraped from this and then dissolved in solutions of caustic potash; the best strength proved to be one of .075 per cent. In this solution the bacilli were left for from twelve to twenty-four hours, and the liquid was then filtered. In the filtrate it was possible to produce a precipitate, either with acetic acid or ammonium sulphate, that gave the reactions of an albuminous body. This material is apparently a specific nuclear proteid, for if injected into animals in sufficiently strong doses they become immune to virulent cultures at the end of forty-eight hours. The authors, therefore, conclude that certain nuclear proteids can be obtained from the cultures of bubonic plague, which are virulent for susceptible animals and which when injected in less than lethal doses produce immunity.

SAILER.

The Antitoxin Treatment of Diphtheria. (*Arbeiten aus dem kaiserlichen Gesundheits-Amte.*)

The publication of work from the Imperial Board of Health in Berlin gives some very interesting statistics concerning the antitoxin treatment of diphtheria. While, in conclusion, the compiler of the great array of figures feels justified in calling this much-discussed treatment a distinct progress in therapeutics, we leave it to our readers to judge for themselves. The reports, gathered by Dr. Diendonné from April, 1895, to March, 1896, were furnished by 258 physicians from 204 institutions. Of 9581 cases of diphtheria treated with antitoxin, 1489 proved fatal, or $15\frac{1}{2}$ per cent. After deducting the absolutely hopeless cases, which perished within the first twelve hours after they were seen, the mortality is reduced to $14\frac{7}{10}$ per cent. Adding to these 9581 cases the result of a former report (January to

April, 1895) and 1328 cases from March to July, 1896, published later, a total of 13,137 cases, divided over eighteen months, furnished a mortality of 2082, or $15\frac{8}{10}$ per cent. O fthe 9581 cases, there were noted as severe 4642, or $48\frac{1}{2}$ per cent., of the latter nearly one-half ($29\frac{4}{10}$ per cent.) died. The number of mild cases was 3059 ($31\frac{9}{40}$ per cent.), with a mortality of 0.49 per cent. 4085 patients, or 42.6 per cent., presented the laryngeal variety, 2744 of which were operated upon (tracheotomy or intubation). These show a mortality of $32\frac{3}{10}$ per cent. The early treatment with antitoxin gave the most favorable result. Thus, the mortality of cases treated on the first day was 6.6 per cent., that of those treated on the second day was 8.3 per cent., of those treated on the third day was 12.9 per cent., of those treated on the fourth day was 17 per cent., and of those treated on the fifth day was 23.2 per cent. Sudden deaths or severe effects of the injection did not occur, and it is claimed that in a number of laryngeal cases operation was rendered unnecessary by the prompt and decided effect of the antitoxin.

F. A. Paulig.

SURGERY.

Experience in the Treatment of Cancer of the Rectum. (*Sammlung klinischer Beiträge*, May, 1897, Nos. 83, 84.) By P. Kraske.

Twelve years ago Kraske recommended to the *Kongress der Deutschen Gesellschaft für Chirurgie* a new method for the extirpation of carcinoma of the rectum, as the methods in vogue at that time were in no way all that could be desired. Volkmann, Kocher, Diffenbach, Velpeau, and Hueter, each in turn had devised various operative procedures, but they too left much to be wished for. Kraske's, or the so-called "sacral, method" was the first to make the upper segment of the rectum accessible to the surgeon's knife. The active literary work on this subject was occasioned chiefly by Kraske's original publication; he, therefore, considers it his duty to place before the public his experiences with carcinoma of the rectum during the past ten years. During this period 110 cases have come under his observation, and of these 80 have submitted to the radical operation, a careful record of each of which may be found in a table appended to this article. Among these 80 patients 42 were males, 32 were females; the youngest patient was 32 years old and the oldest 76 years, although the large majority were from 50 to 70 years of age. As for the pathology the large majority (74) were cylindrical-cell carcinomata, the rarer forms including flat epithelial cell and melanotic carcinomata, melanotic sarcomata, and in one case a dermoid cyst, the latter being the only case that has as yet appeared in literature. The shape of the tumors was usually flat or shield shaped, with edges elevated, surface verrucose, the centre being deeply hollowed out by ulceration. There was the greatest variation in the size of growths, in some the circumference being that of a

pfennig piece, in others the whole circumference of the bowel being involved. The discussion of the genesis of rectal tumors is fully entered into. Kraske inclines to the views expressed by Hausee in his book on the "Cylindrical Epithelial Carcinoma of the Stomach and Large Intestine," namely, that glandular covering of the carcinoma takes its origin from the glands on the mucous membrane itself and not from those glands existing beneath the epithelium, or, in other words, carcinoma of the rectum in the majority of cases springs directly from the mucous membrane and not from some deeper-seated embryonal tissue; this being true of the majority, there remain some cases where there is no doubt that the origin of the growth is only explained by the existence in the perirectal space of embryonic tissue, which exists there through some faulty development during fetal life. As for the causes of carcinoma of the rectum that of traumatism is one to be considered. As far as the author's experience goes not one of his patients so affected could give a history of traumatism preceding the onset of the disease. Lowenthal collected from literature the histories of 900 cases of tumors, among which were two cases of rectal carcinoma where traumatism had preceded. While these histories may be true in themselves, they contain nothing to prove the connection between trauma and the later existing malignant growth. If, however, we construe trauma to mean repeated external insults to the tissues, whether they be mechanical, chemical, or thermic, then one can understand how slight injuries of this nature may play an important rôle in the genesis of carcinomata. Continued pressure or irritation of fecal masses, agencies exerting their influence within the rectum, are responsible for only one form of cancer—namely, that which takes its origin from a previously existing rectal polyp, in which a chronic inflammatory process, the forerunner of the malignant growth, had been excited. That carcinomata frequently develop from the seat of a previously existing chronic inflammatory condition is a well-known and established fact. Volkmann made the observation that carcinomata were uncommonly frequent in people suffering from rectal disorders, such as hemorrhoids, chronic catarrh, constipation, bloody stools, syphilitic or dysenteric ulcerations or cicatrices, fistulæ, etc. While the author's views coincide with those of Volkmann, he has himself had no actual example further to establish the soundness of that doctrine. No opportunity was lost to test by microscopical examinations the theory of the parasitical nature of these malignant growths, but the results were negative. To the one who teaches the epithelial origin of rectal carcinomata, as Kraske does, a discussion of the parasitic theory is out of place. The records of his cases prove that heredity, too, plays an important rôle. Symptoms and course, prognosis, and diagnosis are then taken up in the paper. The expectation of life is estimated with difficulty, since in many cases two or three years elapse before the patients are conscious of their condition. For the cylindrical-cell variety it may be placed at four or five years; the flat-cell carcinomata run a more rapid course; the melanotic

growths are the most malignant of them all. Probably the patient will not be cognizant of the existing growth until the latter becomes large enough to cause some obstruction of the bowel and ulceration is established. Then the evidences of obstruction follow, more quickly, of course, when the whole circumference is involved, and associated with them a train of symptoms, such as dull pain, sense of pressure and fulness in the rectum, sometimes in the loins, failure of appetite, and impairment of nutrition. Kraske does not attach so much importance to the diagnostic value of ribbon-shaped stools as is customarily ascribed to them. Then follow the classical train of symptoms: constipation gives way to diarrhea, distention is frequent and painful, the discharge of blood, foul-smelling pus, and necrotic tissue, products of the progressive ulcerative process. The patient becomes emaciated. Perforative peritonitis may carry him off suddenly, or his sufferings may continue, the growth infiltrating by degrees the surrounding structures (*e. g.*, the genito-urinary organs), when further complications arise to add to his pitiable condition. Finally, if not killed by pneumonia or some intercurrent disease, the patient dies of exhaustion. Metastasis occurs late in rectal carcinomata, and the involvement of the lymphatic glands is observed neither so early, so regularly, nor so extensively as one is accustomed to find in other organs. It may further be said of metastasis that a rectal carcinoma remains local for a longer time than most other such growths, and its prompt removal offers more favorable prospects for a permanent result. This fact impresses the importance of an early diagnosis. The physician should be cautioned not to be deceived by the patient, who attributes his train of symptoms to the existence of hemorrhoids and presents himself to the physician with his own diagnosis. A hasty inspection may reveal a varicose enlargement of the veins about the anus, the existence of which may, unfortunately, be enough to satisfy the physician as to the correctness of the diagnosis presented to him by the patient. A careful digital examination under chloroform is the only means of securing positive evidence in suspicious cases. There may be cases where the high seat of the growth is beyond the reach of the examining finger. Kraske recommends the examination of the patient in the upright position, which will enable one, when, as is usually the case, invagination takes place, to palpate the growth. The author describes in detail the sensation communicated to the finger palpating an invaginated tumor, in the upper segment, comparing it to the os uteri distorted with lacerations and cicatrices. Of a different nature is the sensation communicated by palpating those growths situated in the lower segment of the rectum, when invagination does not take place. The physical properties of rectal cancer are so characteristic that it is not easy to confuse it with other affections of this organ. There are cases where confusion may arise—*e. g.*, when pressure is produced in the rectum by growths of neighboring organs. Kraske finds no difficulty in the differential diagnosis from simple ulcerative or syphilitic proctitis, where the stenosis of the

bowel is, both in form and existence, fundamentally different; in carcinoma the stenosis is caused by the tumor encroaching on the lumen; in syphilis, by an actual stricture. Syphilitic ulcerations are diffuse, while the carcinomatous are limited and surrounded by thickened elevated edges. Of diagnostic value, too, is the fact that syphilitic ulcerations frequently involve the surrounding structures, leading to periproctitis, abscesses, and fistulæ. Especially seldom is this the case with carcinoma. Secondary in importance only to the establishment of the diagnosis is the ability to determine the extent and movability of the tumor. In all these growths which one can reach only with the tip of the finger, no attempt should be made to outline the upper border, for rough manipulation has in such cases, through rupture of the bowel, proved fatal.

Treatment of Rectal Carcinoma.—The experience of many years has firmly established the author's views as to the indications for operation. In the first place, the high position of the tumor is of itself no contra-indication for operation. If there are at the same time firm adhesions, the operation is difficult and may be impossible, and, if the growth is firmly adherent to the uterus, bladder, or pelvic bones, it should be pronounced impossible. Metastases may or may not be contra-indications. The age and resistive power of the patient, as well as any other coexisting diseases, must be considered when deciding the question of operation. Before the operation is undertaken a preparatory course of treatment should be established. The bowel should be completely emptied with purgatives and enemata. This is a factor essential for the success of the operation, which should never be undertaken until the contents of the bowel have been completely evacuated. One is able to determine when this has been done, by resorting to abdominal palpation, but more especially to an examination of the urine. Kast and Baas showed that the presence of ethyl-sulphuric acid in the urine decided this question. The method of the preliminary examination of the urine Kraske strongly recommends. When a marked stenosis exists and it is impossible to empty the bowel completely, a preliminary temporary colotomy should come into consideration; but it is not to be recommended in all cases, since the advantages in the procedure are not, in Kraske's experience, very pronounced, while at the same time we are introducing a complication into the treatment that may seriously affect the outcome of the radical operation. If a colotomy should be necessary, it should be carried out as a preliminary operation, at least one or two weeks in advance. The best site at which to establish an artificial anus is, without doubt, at the transverse colon, and not in the sigmoid flexure. As for the extirpation of the growth itself, its execution depends on its size, seat, and extent. The difficulties involved in removing those growths occupying the lower segment of the rectum are slight. Above all, it should be urged that the incision be made in thoroughly healthy tissue, allowing a large margin around the tumor, for it is the neglect of this precaution that is in many cases responsible for recurrence. Involvement of the whole circum-

ference may require a formal amputation of the rectum. The author's technique differs but little from other surgeons', and especially from that of his master Volkmann. In those cases where the tumors reach to the anterior layer of the peritoneum, anal and perineal, in combination with the sacral, incision is the method recommended. Where the growth is highly situated and does not involve the lower end of the rectum or anus, the method which attains an ideal result—namely, removal of the growth with preservation of function—is resection of the rectum by the so-called "sacral method" first described by the author himself. Kraske gives observations gathered from his large experience. His sacral procedure includes three steps: (1) the preliminary operation on the sacrum; (2) the resectio recti; (3) the treatment of the peritoneum, the free end of the bowel, and the wound. A detailed description is given of his method of procedure in the removal of the sacrum, which in the essential points is in conformity with his original views. One modification he has adopted—namely, Hochenegg's curved incision through the soft parts by a bow-shaped incision instead of the median incision. This change he considers of great importance. The osteoplastic method, in which the bone and soft parts are included in the flap and replaced at the close of the operation, is strongly condemned; in its place Kraske has adopted a procedure which is a combination of the osteoplastic with the original sacral method, and consists in the resection of the left ala of the sacrum and a temporary exarticulation of the coccyx. The next step of the operation—*i. e.*, the resection of the rectum—is described in detail; as regards the care of the peritoneal opening, the use of gauze tampons, and not sutures, is resorted to as a means of closing it. The suture has many disadvantages, and in some cases its employment would be impossible. The increased amount of time required for its application is of itself for many patients a serious objection. The resection of only the malignant segment is preferred to amputation of the entire lower end of the rectum, because of the preservation of the complete functional power of the sphincter. By those who know that when recurrence occurs it is not from the mucous membrane, but from the cancer cells left behind in the tissue external to the bowel, the criticism, by some advanced, that in resection there is greater possibility of recurrence, will be overruled. The treatment of the cut section of the bowel, the next step of the operation, is carefully discussed. Kraske is of the opinion that every attempt should be made to attain union by first intention, and to attain this end the whole circumference of the gut is sutured. To secure good results a week of careful preparatory treatment should be instituted before the operation, and opium administered for eight or ten days afterwards. As for the treatment of the external wound, the only sure method of avoiding ulceration is in the use of the carefully introduced tampon of iodoform gauze, which should be allowed to remain in for at least a week, after which time the dressings should be changed more frequently. It is impossible to express in exact numbers the immediate danger of the operation. Statis-

tics compiled from the results of a group of operators cannot be relied upon, because in many cases only the favorable cases are published, and because individual operators differ as to the indications for operation, some selecting only the most favorable cases while others operate on a large majority of those that come under their observation. An instance of this is cited from the statistics of Cripps and König. The former, out of 400 cases, selected only 38 (9 per cent.), with a mortality of only 6.5 per cent., while the latter, out of 120 cases, selected 96 (80 per cent.), with a mortality of 32 per cent. Of the author's 80 operative cases 15 died, a mortality of 18.7 per cent. The fact that the mortality has been higher since the sacral method has been introduced is attributed to the fact that by means of this procedure more difficult cases are undertaken than heretofore. Comparing the author's series during the first five years, which he considers the experimental period, and the latter seven years, the mortality has dropped from 34 per cent. to 9.8 per cent. Of the fifteen fatal cases eight can be selected in which death was not due to this operation in particular, but might have followed any operative procedure. There remain only seven fatal cases to be attributed to the operation, which reduces the mortality to 8.75 per cent. for the entire period, and, for the series of 51 operations in the last seven years, to 3.9 per cent. The cause of death in four of the above cases was peritonitis, which was brought on by a premature bowel movement, occurring in the course of the first post-operative day. By careful preparatory treatment this can be avoided. The complication most dreaded by the author is infection of a rather peculiar type, difficult of diagnosis in the early stage and due probably to a mixed infection of *Bacillus coli communis* and *streptococcus*. Four cases of this form of infection were noticed, three terminating fatally. The best and only protection against this complication is the most careful tamponing of every pocket in the wound and the not too early removal of the tampon. The most frequent complication of this operation is cystitis, attributed to a resort to catheterism, which is invariably necessary. When no complications arise there is in most cases an entire absence of fever. The time required for the wound to close is usually from four to six weeks. The effects of the operation are soon in evidence. The patient gains in weight, improves in appearance, and sometimes entirely recovers. The functional activity of the rectum is or is not preserved according to the nature of the operation. When the anus and sphincter are involved and therefore excised, an anus is constructed which has all the advantages of the excised one; these patients must, however, wear a pad after the operation. In the author's series of 65 cases, in 4 an artificial anus was constructed; in 15, in which the sphincter could be in part retained, the patients preserved slight continence; in 7 cases an artificial anus in the sacral region was formed (in all of which cases the unnatural opening could be closed with a proper fitting truss); in the remaining 39 cases the union of the divided ends of the bowel and the restoration of function were complete. These results were

difficult to obtain, as in a number of cases a fistula formed which was with difficulty closed. The first closure of the fistula sometimes resulted in the formation of a stricture, which required dilatation; but, in those cases where union of the granulating surfaces was effected comparatively soon, this stenosis seldom occurred. As to the permanent results of the operation, the author has been able to trace, with the exception of five, all his cases; therefore, in considering the frequency of recurrence, these five, together with the 15 fatal cases, are excluded. Of the remaining cases 22 died of recurrence from half a year to twelve and three-fourth years after the operation; 16 died of intercurrent affections without recurrence or metastasis; 15 lived without recurrence for periods varying from three-fourths of a year to eight and a half years. In conclusion Kraske expresses his firm belief in the advisability of operating on this class of cases, and is convinced that the procedure is most justifiable, inasmuch as it prolongs life, and during the period in which relief is procured from this dreadfully fatal malady the ability to work and to enjoy life is restored. In order to make the results still more positive, he urges upon physicians the importance of an early diagnosis and early operation. A history of the eighty cases concludes the article.

FRAZIER.

Treatment of Aneurisms in General, and of Aneurism of the Aorta in Particular, by Subcutaneous Injection of Gelatin Solution. (*Gazette des Hôpitaux*, June 24, 1897.) By MM. Lancereaux and Paulesco.

In 1895, M. Dastre proved that the injection of a solution of gelatin into the veins of a dog rendered the blood more coagulable. This discovery has been utilized in the treatment of a case of aneurism of the first portion of the arch of the aorta. The patient was a male, aged forty-six years, who had previously had an attack of malaria, and the aneurism was undoubtedly due to a malarial aortitis. The aneurism was characterized by neuralgic pains in the first intercostal nerves, radiating to the inner side of the arm, true crises of angina pectoris, and a tumor in the neighborhood of the third and fourth costal cartilages a little to the right of the sternum, which finally measured 14 by 15 cm. This tumor had eroded the second, third, and fourth right cartilages, the extremities of the corresponding ribs, and a large portion of the sternum. On the surface of the tumor patches of ecchymosis were to be seen, soft and depressible, in the neighborhood of which the blood was directly in contact with the very thin skin. On January 20th, 50 c. cm. of a 1 per cent. sterilized solution of gelatin in a $\frac{1}{10}$ per cent. solution of sodium chloride was injected into the subcutaneous tissue of the left buttock. The solution was injected at a temperature of 37° C. (98.4° F.). There was a slight reaction following this injection. During the following days the tumor became somewhat diminished in volume and the pains completely disappeared; but soon the

tumor returned to its former dimensions, the walls again became soft, and the intercostal pains returned. On February 10th, a second injection of 150 grammes of a solution similar to that first employed was given. This solution was followed by results similar to those which followed the first injection, except that there was no reaction. Since that time twelve injections similar to the second have been made at intervals of from two to five days. The tumor diminished in volume (2 cm. in the vertical and 1 cm. in the transverse diameter). It is very firm, and, although on palpation a pulsation can be felt, that pulsation was not expansible, but was transmitted from the aorta. The pain entirely disappeared and the patient left the hospital May 25th.

SWAN.

Concerning the Transmissibility of Mumps from Man to Dog. (*Gazette des Hôpitaux*, October 7, 1897.) By M. Busquet.

At the meeting of the Academy of Medicine held October 5, 1897, W. Laveran presented a report from M. Busquet. In the first part of July, M. Busquet was attacked with mumps. On the 28th of the same month his dog, a large Russian bloodhound, aged four years, a robust animal which had never been sick, became evidently ill. The next day, in addition to the same general condition, pressure in the neighborhood of the temporo-maxillary articulation was painful and there was also a slight swelling in the parotid region. These lesions were present during the following days, and M. Bondeand, a veterinary from Bordeaux, made the diagnosis of mumps. The dog was completely cured August 5. Inoculations on gelatin and on gelatin serum with saliva, collected on August 1st, from the orifice of Stenson's duct, gave cultures of a diplo-streptococcus. The direct examination of the saliva showed, among other things, that the buccal secretion was very rich in diplococci, in streptococci, and in leptothrix. M. Busquet thought that his dog, which had the bad habit of eating expectoration, had been infected in that manner. In a former work M. Busquet, in collaboration with M. Terré, had made the observation that a dog, which was inoculated with the diplo-streptococcus of human mumps, was attacked by a swelling of the parotid region, which suppurated. But this parotiditis was used as an argument against the transmissibility of mumps to the dog because of the suppuration. Several observers claim to have proved this transmissibility, while others, veterinarians of the highest authority, declare that the fact has not been established. The conclusions of M. Busquet call for further work upon such an interesting question.

SWAN.

Struma of the Root of the Tongue. (*Beiträge zur klin. Chirurgie*, Vol. XIX., No. 2, 1897.) By Adalbert von Chamisso de Boncourt.

The author reports a case of this rare affection, which was operated upon in the clinic of Professor Kraske. In reviewing the literature of the subject, he calls attention to the fact that most authors of text-books on

pathology either only touch upon or ignore it altogether. The author's case was a female cretin, thirty-seven years of age. For two years there had been increasing difficulty of speech, shortness of breath, and during sleep loud stertorous breathing. Examination of the root of the tongue with the laryngoscope revealed a growth springing from its right lateral aspect, pushing the uvula and the right palatine arch upward and backward, extending to the right glosso-palatine arch, and on the left to beyond the median line of the dorsal aspect of the tongue; it was covered with normal mucous membrane containing numerous dilated veins. A malignant growth was excluded. Preliminary tracheotomy was performed, during which no trace of a thyroid gland could be discovered in its normal position. The growth was then enucleated, after which convalescence was uninterrupted. Six months later patient was again brought to the clinic, showing symptoms of beginning myxedema, and was therefore placed on thyroid treatment. Microscopic examination of tumor showed that it was composed of thyroid tissue, partly embryonal in appearance and partly follicular in character, also known as colloid degeneration, with the formation of cysts, or beginning papillary adenoma of the thyroid gland. The author finds thirteen cases reported in literature, all of which occurred in females and were always situated on the root of the tongue. In some of the reports the condition of the thyroid gland is not mentioned; several authors speak of it as being normal. The tumor itself is very vascular and bleeds profusely on aspiration. Discussing the etiology, the author rejects the theory of metastases of normal thyroid tissue, and, like most writers, believes the growths to be due to embryonic detachment of thyroid tissue. Clinically they are important because of the disturbance of speech which they cause, and because of the danger of profuse hemorrhage from the numerous dilated veins which they contain. In the author's case there existed in addition considerable interference with respiration during sleep. Examinations should always be made with the laryngoscope, and the diagnosis be arrived at by exclusion. Puncture should never be made unless the surgeon is prepared to do the radical operation immediately. The tumor may be removed in one of three ways,—(1) by the galvano-caustic snare, (2) by enucleation through the mouth, (3) by extirpation from without. The second method is to be preferred. In several instances the growth recurred, grew for awhile, and then became smaller again. The results, moreover, as regards speech, etc., were most satisfactory.

MUEHLECK.

Cystadenoma of the Throat. (*Beiträge zur klin. Chirurgie*, Vol. XIX., No. 2.) By H. Plauth, M.D., from the Surgical Clinic of Professor Czerny.

A tumor of this description observed at the clinic last year excited considerable interest, owing to the discrepancy between its clinical and anatomical features; in other words, while it was not possible to make out its ma-

lignancy with the microscope, it nevertheless recurred four times after attempts at extirpation. The patient was a man seventy-two years of age. The tumor was first noticed two years ago. After some inefficacious local treatment, he was operated on, the first time at Würzburg; there was prompt recurrence after two months. In 1895 he entered the surgical clinic at Heidelberg, presenting a fluctuating tumor, divided by a band into an anterior and a posterior portion, the former being located under the chin, the latter under the angle of the jaw, and in it solid masses could be felt. The cyst contained blood. The submaxillary gland was normal and separated from the growth by a dense fibrous band, but, owing to the undoubted malignancy of the growth, it was removed with its duct, as were also the masseter muscle and the carotid artery which were involved. In July, 1895, the tumor had recurred again, and was extirpated for the third time; in December of the same year there had been a very extensive recurrence, involving almost the entire left side of the throat, for which operation was again performed. The wound healed in two weeks, after which the patient was discharged, but, owing to the impossibility of removing the tumor thoroughly, recurrence is almost certain. Clinically it is of interest to note that, barring the frequent local recurrences, the patient remained in good health, showing no evidence of metastases. Professor Czerny was at first inclined to regard the growth as a sarcoma of the submaxillary gland, owing to the frequency with which these neoplasms originate here. The histological examination, however, gave a different result. The sections were stained with alum-carmin, also with Weigert's stain for fibrin, and finally according to Gieson's method. All sections presented the picture of an actively proliferating cystadenoma, with regressive metamorphosis in places, and also presenting spots having the appearance of carcinomatous degeneration. (Weigert's fibrin-stain and Gieson's hyaline-stain gave positive reaction in the degenerated areas, the material of which was evidently of hematogenous and not of secretory origin and comparable to colloid material). The large cyst was probably due to confluence of a large number of small cysts with which the cyst-wall was lined, and not to a preformed physiological epithelial cyst. In both cases we should expect an epithelial lining of the cyst-wall, which, however, did not exist, but its absence can be explained by the number of operations performed for the removal of the growth. Histologically it corresponds to a proliferating cystadenoma, with intracapsular development causing atrophy of surrounding structures by pressure without infiltration. Cystadenomata of glandular origin usually do not recur, the papillary form, on the other hand, very frequently assumes a decidedly malignant character, especially in old age, as is well known in the case of cystadenomata of the ovaries. The question as to the histogenesis of this glandular epithelial growth is very difficult to answer, inasmuch as no genetic connection with normal structure of this kind could be established, and because of the large variety of cystic growths occurring in this region, such as aneurism, blood-cyst, cystic goitre, congenital cyst, bursal hygroma, athe-

roma, dermoid cyst, and echinococcus. Adenomata can develop only from glandular structure derived from the hypoblast, such as the submaxillary and thyroid glands, or detached portions thereof, and the endodermal portions of branchiæ. The author discusses the probable genesis of the growth in question, and refers to the paper of Nasse, who calls attention to the frequency of endotheliomata, angiosarcomata, and alveolar sarcomata in mixed growths, and to the rarity of epithelial tumors of the salivary glands. Among fifty-eight cases there were only four of the latter, all showing very clearly their origin from the salivary gland by the granular protoplasm of the cells and the eccentric position of their nuclei. Plauth, therefore, dismisses this as a possible origin for the tumor in his case. Its origin from an endermal portion of a branchiogenic cyst containing cuboidal or ciliated epithelial cells he also considers improbable, since these, as well as those originating from mucous glands contained in these cysts, rarely recur. This, of course, does not hold good for carcinomata originating there. The author is, therefore, inclined to the view that a detached portion of embryonal thyroid tissue constituted the matrix of the growth in question. The paper is very instructive and contains a good *résumé* of the literature of the subject.

MUEHLECK.

On Disturbances in the Growth of the Pelvis due to Contraction in the Hip-Joint occurring in Early Life. (*Beiträge zur klin. Chirurgie*, Vol. XIX., No. 2.) By F. Hofmeister, M.D., First Assistant to Professor Bruns.

The author reports three cases of contracture with flexure of the femur due to hip-disease in youth, and demonstrates the influence of this condition upon the growth of the pelvis in early life. Koenig's definition, that contraction and flexion in the hip-joint are compensated by an increased inclination of the pelvic plane, and this again by an increased lordosis of the spinal column, is, of course, true, but, like other rules, has its exceptions. With the aid of the Röntgen rays, the measurements taken in the usual manner may be shown to be misleading, owing to the pelvis itself taking part in this compensation. In the author's first case the skiagraph showed no appreciable changes on the healthy side, but on the affected side the pelvic bones were profoundly altered. The femur, too, was markedly atrophied, the acetabulum was empty, and the head of the femur was dislocated about five centimetres behind it. The pelvic inlet on the affected side was widened and enlarged, giving to the innominate bone a semicircular appearance. The anterior wall of the true pelvis on the affected side was widened and enlarged in such a manner that the upper surface of the crista pubis could be seen, while the foramen obturatorium was turned inward and backward, thus causing an increased inclination of the affected side. Here the degree of flexion in the hip-joint was very much greater than the external measurements showed, it being partly compensated by the increased inclination of the affected side of the pelvis itself, caused by grad-

ual displacement and changes in the forms of the bones. The generally accepted view, that this bone-deformity is caused by one-sided pressure of the body-weight on the acetabulum of the healthy side, is held to be insufficient by the author, who believes that the weight of the flexed extremity acts as a lever, the long arm of which corresponds to the centre of gravity of the former. The greater the flexion of the femur and the less compensatory lordosis of the spinal column present, the greater will be its tendency to cause pelvic inclination on the affected side. The conclusions are that in case of coxitis with contraction beginning in childhood not too much importance should be placed upon the results of measurement, flexion being frequently partly compensated by increased pelvic inclination of the affected side, making the abnormal high position of the trochanter and the degree of adduction appear less than they really are. For this reason the apparent low position of the trochanter should not exclude a dislocation. The author recommends the use of the Röntgen rays in the examination of these cases.

MUEHLECK.

Pathologic and Clinical Contributions on the Subject of Hemorrhoids. (*Beiträge zur klin. Chirurgie*, Vol. XIX., No. 1, 1897.) By George Reinbach, M.D.

The author calls attention to the almost complete absence of reliable microscopical examinations of this affection reported in literature, the paper of Quenu being the only work of any importance on the subject. The conclusions arrived at by the author are at variance with the old and generally accepted view, first expressed by Walaeus, that hemorrhoids consist of dilated hemorrhoidal veins, and that they are due to disturbances of circulation or stasis. In view of the facts that disturbances of circulation, such as are found in diseases of the heart and obstructions of the portal circulation and of the vena cava inferior are very rarely associated with hemorrhoids, that hemorrhoids have been observed in very young and otherwise healthy subjects, even in the newborn, and furthermore that the affection when thoroughly removed by operation very rarely returns, the old theory of stasis appears to the author to be entirely inadequate to explain the etiology of this affection. To elucidate this question a long series of investigations were made. In order to have proper material for comparisons, a number of sections, taken from the anal regions of very young subjects, varying in age from seventeen days to one and one-half years, were carefully examined with the naked eye and also microscopically. Macroscopically the mucous membrane near the anal orifice was of exceeding fineness; very few veins were visible; the membrane could easily be distinguished from the subjacent tissue as a whitish layer. The boundary line between the skin and subcutaneous tissue is, however, much less distinct. The submucosa contains the fine veins situated near the mucous membrane. Microscopically the submucosa is characterized by a remark-

able vascularity. The vessel-walls are of normal thickness. The author divides hemorrhoids into four types: (1) the type characterized by germinating capillaries, (2) those cases in which cavernous tissue predominates, (3) that form in which very much dilated veins are observed (angioma cavernosum), (4) cases showing marked thickening of vessel-walls, due to chronic inflammation. All, however, show macroscopically a decided increase in the thickness of the submucous and subcutaneous tissue layers as compared with the normal, and in many cases a total absence of phlebectasia. As a result of his study of a large number of sections, the author comes to the conclusion that this affection consists essentially in the new formation of young blood-vessels by a process of germination from the older vessel-walls and the consequent formation of cavernous tissue. Inflammatory changes, such as thrombosis and endophlebitis, may also occur within the neoplasm, but are absent in the majority of cases. Venous stasis, according to this author, has nothing to do with hemorrhoids, being at most a secondary phenomenon.

MUEHLECK.

NEUROLOGY.

The Origin and Destination of Certain Afferent and Efferent Tracts in the Medulla Oblongata. (*Proceedings of the Royal Society*, Vol. LXI., 1897.)

J. S. Risien Russell, M.D., M.R.C.P., Research Scholar to the British Medical Association, Senior Assistant Physician to the Metropolitan Hospital, has attempted to arrive at definite conclusions with regard to the origin and destination of some of the afferent and efferent tracts which exist in the medulla oblongata. The following experimental procedures were adopted: 1. Section or destruction of the lateral region of the medulla between the ascending root of the fifth nerve and the inferior olive. 2. Division of the restiform body. 3. Division of the direct sensory cerebellar tract of Edinger. 4. Severance of Deiters' nucleus from its connections with the medulla. 5. Section of the posterior columns and their nuclei in the medulla. Among the conclusions based on the results of this experimental inquiry, the following are to be found: 1. The descending antero-lateral tract, which degenerates in the spinal cord after a lesion of the lateral region of the medulla, is probably the same as that met with after injury to Deiters' nucleus, and is probably identical with that described by Marchi as degenerating after lesions of the cerebellum, Mott after injury to ground fibres and some of the cranial nuclei, and Biedl after section of the restiform body, its real source of origin being Deiters' nucleus, as contended by Ferrier and Turner. 2. The degenerated fibres which reach the anterior columns of the upper part of the spinal cord through the posterior longitudinal bundles, after a lesion of Deiters' nucleus, are quite distinct from the above tract, and probably be-

long to some system of internuncial fibres similar to those traced by Boyce to the anterior columns of the spinal cord, by way of the posterior longitudinal bundles, after hemi-section of the mesencephalon. 3. The direct descending tract of degenerated fibres met with in the spinal cord in close relationship to the fibres of the crossed pyramidal tract, after a lesion of the lateral region of the medulla, is probably identical with a similar tract described by Boyce after hemi-section of the mesencephalon, and by Biedl after section of the restiform body and ascending root of the fifth nerve; the proximity of Boyce's columnar tract to the latter structure accounting for its probable inclusion in Biedl's lesion. 4. Fibres derived from the restiform body proper, and degenerating caudalwards after section of this structure, do not form an efferent tract in the spinal cord. 5. There is no evidence that the "direct sensory cerebellar tract" of Edinger is composed of afferent fibres, but, on the contrary, it appears to be an efferent tract from the nucleus globosus to the nucleus of Deiters, as suggested by Ferrier and Turner. 6. One of the afferent tracts met with after a lesion of the lateral region of the medulla corresponds so closely in position and distribution with the afferent antero-lateral tract of Gowers that it is highly probable that they are identical, and accordingly that the observations of Mott and of Auerbach are correct in this connection.

HINSDALE.

The Law of the Eccentric Position of the Long Tracts in the Spinal Cord. (*Zeitschrift f. klinische Medicin*, Vol. XXXIII., Nos. 1 and 2.) By Edward Flatau.

The writer has made a careful series of experiments on the spinal cord in animals, and has obtained important results. The ventral fields of the posterior columns, according to him, are the passageways for fibres which leave the columns of Goll to pass into the cinerea, but these fibres cannot be traced into the cinerea, as the method of Marchi does not permit conclusions to be drawn concerning the commencement and termination of fibres, and especially of collaterals, within the gray matter. [Nevertheless, the degeneration of the reflex collaterals may be traced far into the anterior horns.] Fibres leave the columns of Goll within the cord, according to Flatau, though this has been disputed by some. The columns of Goll in the cervical region in man probably contain fibres which come from the lumbosacral and a portion of the *lower* thoracic roots. In the antero-lateral columns the longer the fibres are, the further they are from the cinerea; the shortest fibres are near the cinerea; the longest near the periphery of the cord. The long ascending fibres in the anterior columns pass backward toward the lateral columns in their upward course. The posterior part of the direct cerebellar tract is more compact in its superior than in its inferior portion. The ascending "conjunction fibres" (column fibres) are chiefly in the lateral columns and in their ventral portions; the descending "conjunction fibres" are chiefly in the anterior columns—though some are

in the lateral—and along the ventral fissure and the anterior border of these columns. Experiments made by cutting the dog's cord and irritating it with electricity showed that the further posteriorly and peripherally the electrode was placed in the transverse area of the crossed pyramidal tract, the more distally were the muscles situated which were contracted by the current. The comma zones in the posterior columns are formed by the descending posterior root fibres. The "law of the eccentric position of the long fibres in the cord" is not in favor of the possibility of primary systemic spinal diseases. The systemic arrangement of degenerated fibres in the cord is not the result of primary disease of certain systems functionally related, but the result of the eccentric position of the long tracts, and whenever many column neurones or posterior root fibres are diseased at any part, secondary degeneration in the long tracts will occur.

SPILLER.

An Experimental Investigation of the Cervical and Thoracic Nerve Roots in Relation to the Subject of Wry-neck. (*Brain*, Parts LXXVII. and LXXVIII.) By J. S. Risien Russell, M.D., M.R.C.P.

On account of the recent important discussion of the treatment of spasmodic torticollis at the meeting of the American Neurological Association, a report of which has appeared in the *Journal of Nervous and Mental Disease* for October, this paper by Russell cannot fail to excite much interest on the part of American neurologists. He speaks of the uselessness, in many cases, of division of muscles and stretching of the spinal accessory nerve. Division of the posterior branches of the upper cervical spinal nerve roots (Gardner, Keen, Horsley) is the only measure which offers a reasonable prospect of permanent relief in severe cases. It is naturally important to know (1) the exact number of nerve roots electrical excitation of which results in contraction of muscles which bring about movements of the head on the trunk; (2) the precise position in which the head is placed by contraction of the group of muscles supplied by each individual nerve root; (3) in how many roots a given muscle is represented; and (4) the muscles represented in each nerve root. To solve these problems Russell experimented on a number of monkeys, cutting and electrically irritating nerve roots. The results he obtained are of the greatest value and differ considerably from the statements in Quain's textbook on anatomy. He found that there is considerably more individual variation with regard to the nerve-root supply of the neck muscles than of those of the limbs. Different segments of any given muscle responded when one or other of the nerve roots supplying the muscle was excited electrically. In some muscles this differentiation of parts was such that only a certain portion of the muscle, either a longitudinal or transverse portion as the case might be, responded on excitation of one of its nerve roots. He found that on comparing the combined movement which results on excitation of a given nerve root with the individual muscles actually

represented in the same root, it became obvious that the resulting combined movement must depend on the preponderance of certain muscles over others, which, if acting alone, would bring about a very different movement. Despite the variations met with as regards the precise muscles represented in a given root, or the roots supplying a given muscle, the movement resulting on excitation of each root remains wonderfully constant. While the knowledge of the precise innervation of the various muscles responsible for the movements of the head on the trunk are important, no less important is the information which we derive from the results of these experiments, in which the position assumed by the head in relation to the trunk was noted. In the most common forms of torticollis surgical treatment must be directed, chiefly at all events, to one or all of the four upper cervical nerve roots. Where the lateral inclination of the head, by which the shoulder and side of the head and face are approximated, exists, the first and second cervical nerve roots are those to which attention should be directed, while in those instances in which the chief movement of the head is one in which the occiput is drawn backward, so that the face looks more or less upward, the third and fourth cervical nerve roots should engage our attention. The results further point to the fifth and sixth cervical nerve roots being the least likely, of the cervical series, to conduct impulses from the central nervous system, the cutting off of which is likely to be followed by any material relief in any muscular spasm which may be present, causing wry-neck. It is also important, with a view to prognosis after such operations, that even muscles supplied by the seventh and eighth cervical nerve roots may by their spasm bring about movements of the head on the trunk indirectly. In those cases of wry-neck due to spasm of the scaleni muscles there is no possibility of relief by division of nerve roots, inasmuch as these muscles are innervated by the sixth and seventh cervical and first thoracic nerve roots. The upper limb is innervated by the lower cervical and first thoracic nerve roots, and accelerator and augmentor fibres of the heart are contained in the upper thoracic roots. It is not probable that in those cases in which a muscle is represented mainly by two nerve roots, but also to a less degree by a third, the full force of nervous discharge may reach the muscle by this comparatively insignificant path when the chief nerve roots are cut ; Russell has shown, however, that in dealing with the limb plexuses the power of recovery after division of a nerve root is wonderful, and that this occurs when there is no possibility of reunion taking place between the divided ends of the root.

SPILLER.

Conducting Element of the Nervous System. (*Mittheil. aus der zoologischen Station zu Neapel*, Vol. XII., No. 4, Berlin, 1897.)

Stefan Apáthy contributes an elaborate monograph on the conducting element of the nervous system and its topographical relation to the nerve-cell. His publication is the result of seventeen years of study in the bio-

logical laboratory, and his observations were made principally upon the nerve cells of leeches and common worms. It was not possible to pursue these studies so satisfactorily in vertebrates. The author demonstrates that the essential and ultimate elements constituting the nerves and nerve tissue in general are the neurofibrillæ. These run in such a manner that there is a great optical as well as mechanical difficulty in separating or isolating anatomical units, viz., the conducting primitive fibrillæ, in the particular conducting pathway so as to be uninterrupted throughout as far as the peripheral end of the tract. The method employed was to fix the specimen in sublimate solution or sublimate alcohol, imbed in paraffin or celloidin, and stain with chloride of gold. Difficult as this may be, Apáthy seems to have succeeded in tracing the neurofibrillæ from nerve cell to nerve cell and even through successive nerve cells, and he has illustrated his discovery by an elaborate series of plates. These results have been partially corroborated, we understand, by Retzius, and, if they are what they seem to be, they will give us new conceptions of neuropathology. The neuron, instead of being independent, is to be understood as having a direct anatomical connection with other neurons.

HINSDALE.

PATHOLOGY.

Streptococcus Serum (Marmorek) and Streptococcus Toxin. (*Wien. klin. Woch.*, October 28, 1897.) By Ferdinand Schenk, M.D.

The following experiments were undertaken as a continuation of the work of Borneman published in the same journal in 1896. Four horses were immunized, all with the streptococcus Marmorek; all of them reacted strongly to the injections at first, but subsequently seemed to suffer no bad effect from active virulent cultures. All had previously been rendered immune to diphtheria. The streptococci were the same as those that had been supplied to Borneman by Marmorek himself, their virulence having been maintained by successive passage through rabbits. Altogether sixty preventive experiments were made with various quantities of the serum-test obtained from these horses, reaching from 0.2 c. c. to 5 c. c., and the animals were subsequently inoculated with from 0.01 to 0.001 of a c. c. of virulent culture. Of these animals twenty-three survived—that is to say, 36.6 per cent. Those that died had an average existence slightly longer than that of the control animals. Of the latter 11.4 per cent. only survived. Twenty-one animals were tested regarding the curative powers of the serum, as much as 10 c. c. having been given twenty-four hours after the injection of 0.001 c. c. Of these only two survived. Rabbits were taken and streptococcus culture injected into the ear, to develop erysipelas. In spite of the preliminary injection of antitoxin, control animals reacted quite as well as those that had been protected. When more virulent serum was used, the animals died quite as promptly as the control animals. In six animals the serum was employed after the development of erysipelas; one survived and the others died of streptococcus infection. Having

reached the conclusion that the antistreptococcus serum was of no value, Schenk undertook to find out whether the streptococcus really produced toxin or not. He at first endeavored to kill the micro-organisms by means of mixing carbolic acid with infusions of the spleen and liver. Injections of this, however, caused death by carbolic-acid poisoning. An attempt to sterilize the cultures by heat (56°) rendered them innocuous. He then filtered cultures of streptococcus, and found that the filtrate was virulent, causing death within a few hours, but not giving rise to the typical picture of the streptococcic death, and it was not possible to cultivate streptococci from the blood or organs. This proved conclusively that toxins must be present in the culture, and, as a matter of fact, he was able to precipitate them with solution of chloride of zinc without altering their virulence. It appears that when animals have been preliminarily treated with streptococci serum the micro-organisms, although they produce death, show considerable diminution of their virulence. Schenk appears to ascribe this, to some extent at least, to the protective action of the serum, although in general he agrees with Petruschky in denying it any real curative or preventive value.

SAILER.

The Histological Changes Produced by Ricin and Abrin Intoxications. (*Journal of Experimental Medicine.*) By Simon Flexner.

The animals employed were rabbits, guinea-pigs, and mice; all at the time of inoculation appeared healthy. The material was injected subcutaneously, intraperitoneally, or intravenously; the doses employed varied from 0.1 mg. to 3 mg. per kilo of body weight in the rabbit and from .025 to 1 mg. per kilo in the guinea-pig. The duration of life varied from six hours to six weeks. A few animals, however, recovered entirely. The gross morbid lesions were ecchymotic hemorrhage and occasionally peritoneal exudate. The lymphatic glands were congested and hemorrhagic. The mucous membrane of the intestine was, as a rule, pale and the Peyer's patches were swollen. The spleen was uniformly swollen. The liver was dark and contained focal areas of necrosis. In the special tissues the changes found in the lymphatic glands were in part productive, but chiefly degenerative in character. Fragmentation of the cells involved both the cytoplasm and the karyoplasm. The perifollicular lymphatic spaces beneath the capsules contained fragmentated cells and macrophages, and in those cases where hemorrhage had occurred there was considerable fibrin. The mucous membrane of the intestine showed extensive cell disorganization, with the dominant changes in the nuclei. In these various intensely staining bizarre forms appeared, that varied from the minutest particle of chromatin to crescents, vesicles, or roseate and stellate forms. The protoplasm was granular and opaque. Frequently the nuclear fragments exhibited polychromatism; ulceration did not exist, but there was free desquamation of the necrotic epithelium. In the spleen, contrary to the condition usually produced by bacterial toxins, it was found that the Mal-

pighian bodies were less profoundly affected than the splenic pulp. The splenic blood-spaces contained degenerated cells of all possible varieties, sometimes found free, but oftener inclosed in giant phagocytes. In the liver the focalized areas of necrosis were found to consist at first of swelling of the cells, then the whole protoplasm became homogeneous and transparent, the nuclei stained feebly, and finally the protoplasm underwent a hyaline transformation with a special affinity for the acid dyes. Two changes occurred in the nucleus, one a loss of the staining capacity, and the other a diffusion of the chromatin and contraction of the nucleus, so that it stained apparently more deeply. Hemorrhage was common. In the blood-vessels small, light, fibrinous thrombi, almost devoid of cells, were found, particularly in the necrotic lesions. In the lymphatic spaces there was an excessive amount of nuclear detritus. The epithelium of the kidney showed sometimes hyaline change, sometimes necrosis. The heart was often the seat of fatty degeneration; sometimes actual necrosis occurred. In the adrenals and the thyroid glands congestion and at times small extravasations of blood were found. In the former there were some necrotic foci. In animals killed by chronic ricin poisoning the acute lesions were absent, a picture of profound cachexia existed, and the splenic pulp was filled with granules of yellow pigment, usually ferruginous in nature. Flexner concludes that these changes are essentially similar to those found in many forms of bacterial infection and toxemia. He offers, as explanation of the focal areas of necrosis, the possibility that they arise because the circulation in the capillaries that supply them with nutrition is temporarily retarded or at a stand-still at the moment when the poison is acting with the greatest intensity. In those animals that recovered these focalized areas are invaded by leucocytes and the detritus is carried away. Regeneration or, what is more common, scar formation replaces the destroyed tissues. Some excellent plates illustrate the article.

SAILER.

A Tumor of the Breast containing Cartilage and Bone. (*Virchow's Archiv*, Vol. CXLVIII., No. 3, 1897.) By St. Arnold.

The patient, a woman sixty-seven years of age, had had a swelling of the left breast since the spring of 1895, that gradually increased in size and was somewhat painful. In the fall of the same year it was opened, and discharged a quantity of pus and blood. This purulent discharge continued, without any diminution in the size of the tumor, and the patient became profoundly cachectic. The breast was, therefore, removed in December of the same year, with complete recovery of the patient. Microscopically the tumor was found to consist of trabeculæ and dense tissues, in the midst of which were irregular openings containing star-shaped cells. There were also small masses of calcareous substances that, in all respects, resembled bone, and numerous masses of spindle cells with oval nuclei. In the midst of this latter tissue there were blood-spaces lined with endothe

lium. The tumor, as a whole, could be divided into three zones, the first containing the bone trabeculæ; the second, the spindle cells with the cartilaginous trabeculæ, in both of which giant cells were found; and the third, the necrotic area bounding the cavity which had been produced by the suppuration. The tumor was, therefore, diagnosed as an "osteo-chondro-sarcoma" of the mammary gland, and St. Arnold speculates somewhat as to the source from which it originated. He concludes that a tumor containing cartilaginous and bony tissue, separated as this was from any normal cartilaginous or bony tissue, must be due to misplacement of embryonal cells. The question is from what organs the misplaced cells were taken, and, in view of the fact that the tumor contained typical connective-tissue cartilage, which is found only in the intervertebral ligaments, the symphysis pubis, and at the sternal end of the clavicles, and moreover as the clavicle belongs really to the type of sesamoid bones, he concludes that it must have originated from this source; that is to say, it was due to the misplacement of tissue cells from the sternal end of the clavicle.

SAILER.

The Plague Epidemic in Formosa. (*Centralblatt f. Bakt., Parasit., u. Inf.*, June 24, 1897.) By Professor M. Ogata.

The author reports the results of his bacteriological investigations made in Formosa during the epidemic of plague. Compared with the epidemics on the Asiatic continent it was relatively mild, the mortality being 56.1 per cent. He first calls attention to the dissimilarity of the bacillus of Yersin and the bacillus of Kitasato. The former occur rarely in the blood, but invariably in the buboes, are decolorized by Gram's method, non-motile, usually encapsulated, give rise to white translucent colonies with iridescent edges, and form chains composed of short rods in bouillon cultures. The latter occur almost invariably in the blood, are not decolorized by Graham's method, are motile and encapsulated, grow in round, irregular, grayish-white colonies, and form chains that appear to be composed of micrococci. He also calls attention to the discrepancies in Kitasato's first and second account of his bacillus. Blood drawn from the fingers of patients that had been sick from nineteen to sixty-five days failed to show bacteria, either microscopically or in cultures. Nevertheless, when injected into mice it caused death, and from the tissues of the animals pure cultures of the plague bacillus could be obtained. In blood from acute cases, however, he was able to detect the presence of the organism. His conclusions are as follows: In the swollen lymph-glands of all plague patients a pathogenic bacillus is found that always causes a disease similar to plague in susceptible animals. In the blood of plague patients the plague bacillus is not always found, even in severe cases. In the urine and gall of plague patients the plague bacillus has been found. The organism ap pears to be carried from the wounds by insects, such as fleas and mosquitos. In the blood, lymph-glands, and organs of rats that have the plague,

the same micro-organism is found as in human beings, and the fleas found upon these rats also contain virulent bacilli. Various other organisms have sometimes been found in connection with the plague bacillus. This organism is very feebly resistant against antiseptics. It is killed in five minutes by a 5–10 per cent. solution of carbolic acid or a 1 : 10,000 solution of mercuric bichloride. He has been unable to find the plague bacillus in the ground under houses where the disease had existed. Prophylactic measures include the complete destruction of all animals suffering from the disease, and the disinfection of all objects that have come in contact with the plague patients.

SAILER.

Malignant Tumors of the Epithelium of the Chorion, Usually Called Decidual Sarcomata. (*Volkmann's Sammlung klinischer Vorträge*, No. 180, 1897.) By Eugene Fraenkel, M.D.

The theory first advanced by Gottschalk that these tumors originate from the villi of the chorion and consist of a sarcomatous degeneration of the latter, can no longer be maintained, the principal objection to this view being the absence of vessels in the growths. Marchand was the first who recognized their origin from the normal epithelium of the chorionic villi. The latter are normally covered during the first two months of pregnancy by two layers of epithelial cells, an outer one (syncytium) consisting of deeply staining protoplasm without cell-boundaries and containing nuclei rich in chromatin, and an inner layer of sharply defined vesicular cells into whose interstices the first layer sends processes (Langhan's layer). The author reports three cases observed in the obstetric clinic at Munich; all developed after pregnancies or the removal of moles. Two of the patients died of exhaustion and general metastases, while the third, whose uterus was promptly removed, recovered, and, as far as Fraenkel knows, the growth has not recurred. In each case the specimens were carefully studied, with the following results: (1) The tissue described by Marchand, consisting of syncytium and Langhan's cells, is always found in blood-spaces communicating directly with the vessels of the uterus and originating therefrom. (2) The growth invades the uterine tissue proper by way of the blood-vessels exclusively. At first the cells lie free in the lumen of the vessels, later on they become firmly attached to their walls, destroying their endothelium and causing proliferation of the connective tissue of their walls and the formation of granulation tissue. (3) Invasion of the uterine tissue proper without the instrumentality of the blood-vessels occurs at the point of attachment of the cell-masses to the vessel-wall by means of so-called chorionic migratory cells, probably originating in the syncytium. It is difficult to say how far Langhan's cells are concerned in their formation. The cell-masses mentioned under (1) are not capable of penetrating into tissue directly, like carcinomatous cells. (4) Tumors are occasionally observed which consist exclusively of such chorionic migratory cells, but even here it is highly probable that the original tumor-type had existed, and had become obliterated by curettement and necrosis.

MUEHLECK.

The Measurement of the Agglutinating Power in the Blood of Typhoid Patients. (*Comptes Rend. de la Soc. de Biol.*, February 26, 1897.)

In light cases the agglutinating power is often feeble; however, the seriousness of the case does not always correspond to the intensity of this quality. The curve of the agglutinating power during the course of the disease varies in different cases; sometimes it is low at the beginning, gradually rising during the stadium, then to decline, either at once or after having lasted for some time. As a rule, however, the decline takes place in the first stage of convalescence, and then it may remain diminished, but present, for a long time, or it may disappear with great suddenness. This reaction must not be looked upon as in any way the reaction of immunity, but rather as the reaction of infection, as was first pointed out by Widal himself. It was first observed in connection with animals vaccinated against the *Bacillus pyocyaneus*, in 1889, by MM. Charrin and Roger.

SAILER.

Distribution of Agglutinating Substance in the Organisms of Typhoid Patients. (*Comptes Rend. de la Soc. de Biol.*, February 26, 1897.) By Courmont.

The author examined the agglutinating power of the blood, the serum, and the juices of the various organs, obtained at the autopsy of seven cases of typhoid fever. In four of these cases the investigation was simply qualitative, one centimetre of the liquid being mixed with ten centimetres of the culture. In all cases the blood from the heart gave an intense reaction; the juices of the liver and spleen gave a feeble reaction. Many of the bacilli remained motile. In one case, indeed, the juice of the spleen seemed to give no reaction at all. The serous fluid usually responded as well as the blood of the heart. The other three cases were examined quantitatively, one drop of the liquid being used and the estimation made by noting the number of drops of culture that it would agglutinate. It was found that one drop of blood from the superior vena cava would react with two hundred and fifty drops of culture, whereas blood taken from the liver gave a feeble reaction with ten drops. In another case the blood from the heart neutralized one hundred drops, the pleural serum two hundred drops, but the pericardial serum only ten drops. These investigations show that there is considerable difference in the agglutinating power of the various organs. It appears that those in which the bacillus of Eberth is found in greatest abundance contain least of the agglutinating substance, and when it is found in organs in which it is rarely present their agglutinating power disappears. The presence of other organisms, however, in the liquids of the body has no effect upon their agglutinating tendency, for pleural exudate containing pneumococci gave a very marked reaction.

SAILER.

OBSTETRICS AND GYNECOLOGY.

The Treatment of the Chronic Infected Case in Gynecology by the General Practitioner. (*The Practitioner*, November, 1897.) By D. Berry Hart, M.D.

By the chronic infected case the author means that common run of cases which present the following history: Not well since the last labor or miscarriage; at present, occasional pains in back (over sacrum), at the side, or below the left breast; menorrhagia and leucorrhea; bimanual examination shows more or less laceration of the cervix or at least a patulous uterine os, usually retroflexion and enlargement of the uterus, and some inflammatory thickening in its neighborhood, either in the peritoneum, cellular tissue, ovary, or tube. In these cases there are multiple lesions, and all the symptoms cannot be blamed upon one cause, such as the lacerated cervix or displaced uterus, but they all come from a minor septic or sapremic attack after labor or neglected abortion, and so the above name has been adopted. The leucorrhea and menorrhagia are due to an endometritis, while the pain is probably caused by the secondary cellulitic or appendage inflammatory thickening. The retroflexion is an accidental complication of such cases, and not a factor in producing symptoms unless there is also present some downward displacement. The clinical cause of these cases being a neglected abortion, or labor in which there was difficulty in the third stage, there is a large field for prophylaxis in their treatment. A lacerated cervix may be neglected if small, but should be amputated if hypertrophied. Many women suffer from what they are told they have, so it is better to be indefinite in telling them their condition. When menorrhagia and leucorrhea are present with inflammatory thickening, they are best treated by a thorough curettement and application of pure carbolic acid. When menorrhagia and leucorrhea are not marked, but the condition is mainly of minor inflammatory thickening, cotton-wool tampons, with ichthyol and glycerin, and hot douches daily are most satisfactory. The retroflexion, unless complicated by prolapse of the pelvic floor, is best left alone. Pessaries are seldom of value, vaginofixation is dangerous, and ventrofixation fixes the uterus in a false position. The diet, sleep, exercise, occupation of time, and the bowels should be regulated. Finally, some cases may require removal of the appendages or even hysterectomy.

GIRVIN.

Some Notes on Ovarian Tumors, with a First Series of Fifty Ovariotomies. (*The Lancet*, November 6, 1897.) By William John Gow, M.D.

By ovariotomies the author indicates only the removal through an abdominal incision of cystic and solid tumors of the ovary, and also the removal of parovarian and other broad ligament cysts, not the removal of the ovaries for fibroids or inflammatory disease. These conditions may

give no symptoms but abdominal enlargement, or there may be present menstrual disturbances, most commonly menorrhagia and metrorrhagia, and pain. In procidentia uteri in virgins the cause is frequently an ovarian cyst. Suppuration of an ovarian cyst is always the result of infection with pyogenic organisms, which may reach the interior of the cyst through the lymphatics, the Fallopian tubes, the intestines, or the vermiform appendix. The pus in the cysts is usually found to be sterile, and rupture, which may be spontaneous or from violence, does not cause peritonitis. It is often difficult to diagnose ovarian tumors from fibroids, pregnancy, or extra-uterine pregnancy. This operation may be done on a diabetic patient with good results. Exploratory incision should always be made, but if the tumor is found to be malignant and not removable great care should be taken not to break up the adhesions, which would cause a marked increase in the rapidity of the growth of the tumor. There should be no mortality in these ovariotomies if there is no sepsis. The author considers a small abdominal incision and ligation of the pedicle in three or more sections very important factors, as the intestines are not exposed and there is no danger of hemorrhage from a slipped ligature. He does not irrigate, and believes that the care at the time of the operation is far more important than the after-treatment.

GIRVIN.

PEDIATRICS.

Sarcoma of the Cutis of the Newborn. (*Archives of Pediatrics*, November, 1897.) By A. Jacobi, M.D.

The author reports a case of this condition occurring in a male child seven months old. At the age of one month, the mother noticed a small pink spot at the upper left-hand part of the scrotum anteriorly. This gradually increased in size. In a few weeks a smaller nodule was found just below it, and a few weeks later a third one below that. As these nodes increased in size, they became bright red in color. The nodules grew so rapidly that the child was presented at the clinic for treatment on the 4th of February, 1897. Examination at that time showed the diameter of the nodules to be from one-third to one-half of a centimetre. They appeared to penetrate the whole mass of the skin and could be easily lifted up from the subcutaneous tissue. There were five smaller nodulations to the left of these three tumors. These had appeared only a few days previous. In addition to these, there were three small points of pin-head size, two on the left and one on the right of the dorsum of the penis. They could also easily be raised from the underlying tissues. There was no swelling of the inguinal glands. This fact led the author to make the diagnosis of sarcoma rather than that of lupus. By the 11th of February the tumors had grown larger. There was a red line along the urethra throughout its entire course. This had been observed for the first time

by the mother on that morning. The child was operated upon and the whole mass of tumors removed. The subcutaneous tissue was entirely normal. The papules on the penis were destroyed by the thermo-cautery. Healing occurred promptly. The red line along the urethra disappeared on the third day after the operation. Microscopical examination of the tumor showed polyhedral and fusiform cells, closely intermingled with fibrous tissue. There were a few giant cells scattered here and there. These were still covered with the pavement epithelium of the epidermis. The diagnosis was, therefore, giant-cell sarcoma of the cutis. A review of the literature showed that none of the cases hitherto reported originated primarily in the cutis. This case, therefore, is the first recorded.

S. McC. Hamill.

Isolation in Scarlet Fever Unnecessary and Inexpedient. (*The Lancet*, October 23, 1897.) By Arthur Wigglesworth, L.R.C.P. London, M.R.C.S. England, L.S.A.

The author administers to all his patients, as soon as scarlet fever is suspected or diagnosed, from one to six grains of carbolic acid (according to the age) freely diluted with water, repeating this dose every two hours until the rash has finally disappeared. From this period the dose is gradually reduced as to size and frequency until convalescence is established. He has practised this treatment for over sixteen years. In summarizing his results, he says that all the patients seen in the initial stage of the disease recovered, that he has had but three cases of albuminuria, of mild type, and only one case of glandular suppuration, and that all the usual sequelæ have been characteristically absent. All patients have recovered in a remarkably short time and with but little loss of strength. In addition to his results in persons infected he has, as a routine practice, administered prophylactic doses to the other members of the family, and thereafter allowed the freest communication between the attendants in the sick-room and the other inmates of the household, but not allowing uninfected children to enter the sick-room. In the majority, the various households escaped infection altogether; those who were attacked, without a single exception, were infected in a milder form, and only in one instance did a sequel occur. After disinfection no other cases arose unless imported from a fresh source. He concludes from this experience that the carbolic acid has an attenuating action upon the scarlet fever organism, as it has been shown to have upon other forms of bacteria. He cites a number of cases showing the effect of this line of treatment. He relates the case of a family in which there were two children, a boy and a girl. The boy took scarlet fever, and was carbolized (given sufficient carbolic acid to cause a decided discoloration of the urine); when desquamation was completed, the house was disinfected. The girl was semi-carbolized, and did not come into contact with her brother until after his complete recovery. Some time afterwards she contracted scarlet fever at school, became suddenly, violently ill,

and died a few hours after being first seen. This experience led the author to consider the advisability of exposing the healthy children in the household to the infected patients after the latter had been fully carbolized, thereby subjecting the healthy ones to the infection in an attenuated form, which would in all probability cause an infection of a milder type, thus protecting them against a future infection of a more severe type.

S. McC. Hamill.

A Case of Intussusception. (*The Lancet*, October 16, 1897.) By Frederick Brooke, M.R.C.S. England.

The child, a female, was eleven months old. Bowels were constipated and had not been moved for two days until immediately before the first visit. This movement was lumpy in character and slightly streaked with blood. The eyes were sunken; the expression was anxious. There were occasional paroxysms of pain. There was no vomiting, and the pulse was full and regular. The child had been given a teaspoonful of castor oil. The abdomen was moderately distended, not sensitive to pressure. The colon resonance was well marked. The following day the child was found in great pain. There were violent straining and tenesmus, and there had been discharges of blood-stained mucus. There was frequent vomiting. Rectal examination disclosed a sausage-shaped tumor, presenting a central orifice. There was marked abdominal tenderness. The child was immediately given an enema of warm water and inverted. Very little of the water was retained, but a subsequent examination showed that the tumor had receded somewhat. After a short interval, another pint of water was injected, slowly but forcibly, and the patient again inverted. The intussusception could now only barely be reached with the tip of the finger. The treatment was repeated. After this injection, there was no sign of the intussusception. The hips were elevated and the child kept perfectly quiet. There was immediate relief from pain, and the child was given drop doses of tincture of opium to control peristalsis. The next day the abdomen was found sensitive to pressure and moderately distended. The child had had occasional pain and vomited once. She seemed brighter; the eyes were less sunken. During the day she passed flatus several times. The recovery from this point was uneventful and complete.

S. McC. Hamill.

The Early Diagnosis of Sporadic Cretinism, with the Report of a Case. (*Medical Record*, October 2, 1897.) By Henry Koplik, M.D.

The writer has observed in two cases under his care that the symptoms of idiocy and myxedema disappeared, but the child after fully two years of treatment remained somewhat deficient physically and mentally. One, a boy, who was about fifteen months old at the beginning of treatment, after two years of constant administration of thyroid was unable to speak sentences and his physical development seemed retarded about one year. In

the other case much the same defect in speech was noted. The author calls attention to the fact that no cases of congenital sporadic cretinism have been published in American literature. He believes that the vast majority of cases, especially those which have come under observation at the age of from one and one-half to two years, were sufferers from the condition long before it was recognized. The statements of the parents as to the beginning of the symptoms are altogether unreliable. Thus, in the two cases referred to, the mothers failed to recognize the abnormality and had been treating the child for the relief of other conditions. One of the children had been under the care of a physician, who had failed to recognize the disease. As a rule, the cases are first seen when the symptoms have developed in their most pronounced type. K. reports two cases treated at a very early age. One patient was a female infant, aged one month, sister of a fully developed cretin. The child had icterus neonatorum, which began at birth and lasted six weeks. At the age of one month the child was presented for treatment for the relief of jaundice. The expression of the face was strikingly prognathous. The child seemed stupid. Her head was broad at the base of the skull and smaller at the top. The abdomen was distended. The extremities were short but not deformed. There was no myxedema, but the skin was rough and wrinkled. The eyelids were slightly puffed. The tongue was very large and thick. The neck was short and thick. The thyroid was not palpable. Hemoglobin 85 per cent. The rectal temperature 96° F. Under thyroid treatment the temperature gradually rose to 98° F. After six months' treatment the child became bright and interesting and in every way resembling a normal infant. The child continues under the thyroid treatment, one-half grain thrice daily. The improvement in this case was much more satisfactory, as far as restoration to normal conditions is concerned, than was that of the brother for the same period. He was fifteen months old at the beginning of treatment. The diagnosis in the former case was based upon the following observations: the stupidity of the infant, the reduced internal temperature, the conformity of the extremities as related to the trunk, the wrinkled skin on the forehead and head, the narrow, animal-like forehead, the thick lips, the coarse cry, and the immediate improvement under thyroid treatment. The second early case occurred in a girl nine weeks old. Parents healthy; no history of goitre; no consanguinity; the patient was their first child and was breast fed. The mother noticed that the child was stupid from birth. Labor was normal. Baby did not resemble either parent. Her forehead was low and narrow, nose flat, and eyelids puffed. Her abdomen was very large and she cried incessantly. She had the coarse features and expression of morbid cretinism. The tongue was large, broad, thick, and protruding at times. The extremities were quite dwarfish as compared with the size of the trunk. The skin had a green hue. No thyroid palpable. The skin, hands, and feet were cold; the skin of the nose was finely wrinkled. Cry was coarse and deep. Rectal temperature 97.8° F. Bowels constipated.

Hemoglobin 105 per cent.; red cells 3,020,000, white cells 13,500. Under thyroid treatment the child improved rapidly. At three and one-half months the child seemed as bright as a normal infant. The thyroid treatment is still continued. The blood examination in these two cases was interesting for the reason that it showed a less degree of anemia in the early stages of the disease than is found in the more advanced cases, and again for the reason that under treatment the hemoglobin percentage was very much reduced.

S. McC. Hamill.

Chronic Icterus (with Fatal Termination) in two Brothers and Sisters during the Age of Breast Feeding. (*Centralblatt f. innere Medicin.*) By Brandenberg.

Two children of the same mother died of jaundice. The first pregnancy ran a normal course. The child was healthy during the first four weeks of life, but at that period icterus developed, and continued up to the time of the child's death, which occurred on the first week of the seventh month. The liver was enlarged during life. There was a small abdominal effusion. During the second pregnancy, the mother was jaundiced two weeks prior to her confinement. The offspring became jaundiced in the third month. The jaundice fluctuated and at times quite disappeared. The child gradually failed and died. At the autopsy the liver resembled that of acute yellow atrophy. In the red stage the kidney showed an advanced fatty degeneration. The pulp of the spleen was much hypertrophied. The cause of this condition could not be ascertained. The mother's third child remained healthy.

S. McC. Hamill.

The Glandular Fever of Childhood. (*The Lancet*, October 16, 1897.) By G. Scott Jackson, M.D.

The author refers to some cases in which he has observed a few swollen glands in the neck during a well-marked epidemic of milk infection. The involvement of the glands he considered due to absorption of poison from the intestine. In the cases in which diarrhea existed there was little, if any, enlargement of the cervical glands. Where, however, constipation existed, the intestinal absorption was more complete and glandular enlargement more evident. In the course of this epidemic a case occurred which he diagnosed as glandular fever, from its close similarity to the cases described by Dawson Williams in his recent papers on this subject. The patient was a healthy child, three years old, with a good family history. He went to bed apparently well, but, soon after midnight, awoke screaming and quite delirious. He vomited and was feverish. He was somewhat better in the morning; worse during the following night. On the second day the temperature was 102.8° F. There was some tenderness across the abdomen. Bowels had not moved for two days. There was no angina,

no redness of the fauces. The following day the temperature rose to 103° F. There was a tender, swollen gland under the anterior border of the left sterno-mastoid. The bowels had been freely opened by castor oil. Two days later the whole chain of glands on the left side was enlarged and tender. Temperature 102° F., and child much distressed. The right side became involved at this time, and three days later the head seemed to be fixed by a row of hard glands on each side. The temperature was 103½° F. On the evening of the same day the child was seized with an attack of hematuria. Temperature had fallen almost two degrees. The patient was more comfortable. On the following day, after the discharge of two or three watery stools, the temperature fell to the normal. Recovery was progressive, eventually complete. Urine contained a trace of albumen for a period of about eight days.

S. McC. Hamill.

Sporadic Cretinism. (*The Lancet*, October 2, 1897.) By A. Gordon Patterson, M.A., M.D.

The mother of this patient, a male child, observed that he was backward from the seventh month, and since that time he had suffered from constipation and was always cold. The child was the first born. The labor was normal. The family history had no bearing upon the case: there was no consanguinity; no history of thyroid disease; no syphilis. Between the eleventh and nineteenth months the chief treatment given him was an attempt to overcome the existing constipation. At the eleventh month there were no signs of teething. He had never had diarrhea, febrile diseases, or convulsions. He was twenty-five inches high. The head was dolichocephalic. The anterior fontanelle was very open and the frontal suture distinct. The occipito-parietal junctions were widely separated, and on the right side there was a triangular space devoid of bone. The hair was scanty, fine, and short; the scalp was covered with a brownish scurf. The nose was very flat and broad at the bridge and the cheeks were thick and full. The mouth was widely open, and the tongue, which was too large, always protruding. The ears were waxen, neck thick and short. No thyroid could be found. There was a slight swelling over the right clavicle. The abdomen was barrel-shaped and the superficial veins were very distinct. The hands were remarkably thick and hard, but did not pit. There was no evidence of rickets. The skin was dry and harsh, with scarcely any secretion of sweat. The saliva was abundant, but no nasal secretion existed. The muscles were but little developed. The left testicle had descended into the scrotum, but the right was still in the inguinal canal. The rectal temperature was 97.2° F. His intelligence was *nil*. There was great anemia. The liver and spleen were not enlarged. The urine was normal. At nineteen months the condition was much the same as that above described. At this age the thyroid treatment was begun. Under treatment the child's condition improved rapidly in every respect. The

bowels, which had resisted all treatment previously, became quite regular. The temperature became normal. At the end of a week his limbs had become soft and pliable and he was able to sit up in his coach. At the end of a month he developed eight teeth and his color became less sallow. At the end of eight months he cut sixteen teeth. The muscular development was not rapid. Physically he seemed normal. The mother of this infant gave birth to a female child who lived but twenty minutes and was an exaggerated counterpart of the first. During a third pregnancy the mother was treated with thyroid extract from the third month. As a result, she gave birth to a healthy child. The administration of thyroid gave no discomfort of any kind.

S. McC. Hamill.

A Case of Advanced Cretinism treated with Thyroid Extract. (*The Lancet*, October 2, 1897.) By H. E. Drake-Brockman, F.R.C.S. Edin.

The patient was a lad of sixteen years. He had a heavy, dull countenance, the mouth was half open, saliva dribbled, the tongue protruded, the eyelids were puffy, there was a slight tendency to exophthalmos, the thyroid was enlarged, the superficial veins were distended, especially on the right side, where the tumor was tense and elastic to the touch, rather suggesting a cystic growth. There was a slightly musical bruit over the most prominent part of the tumor. The neck measured fourteen and a half inches. The boy was given three grains of the dry extract daily. In three months the improvement was remarkable. The neck measured twelve inches, the bruit had disappeared, and the patient was able to walk a distance of twelve miles. The author, noting that there still persisted an absence of the patellar reflex, added daily doses of five grains of didymin to the treatment. This measure was suggested by the statement of Brown-Séquard to the effect "that orchitic fluid worked wonders in tabes dorsalis," a condition in which the absent patellar reflex is a prominent symptom. The reflex began to return after two weeks of the combined treatment. The patient was lost sight of at this juncture.

S. McC. Hamill.

Notes on a Case of Cretinism successfully treated with Thyroidin. (*The Lancet*, October 2, 1897.) By C. Morton Anderson, M.R.C.S. Eng.

A. reports a case of cretinism occurring in a girl of eleven years, who first manifested symptoms of her condition at the age of three years. Her bowels were not constipated. Her mental condition was of a very low type. There was nothing unusual about the case, which is reported merely to show the good effect of treatment when begun at this rather advanced age. The treatment consisted in the administration of two and one-half grains of thyroidin every other day. Later this was increased to five

grains, and still later to seven and one-half grains *every day*. The improvement was rapid from the beginning of the treatment; the child's growth was rapid and the mental development in keeping with the general development. The child was still under treatment when the case was reported, and the improvement progressing. There was nothing in the family history which had any bearing on the case.

S. McC. Hamill.

Tendency to Bending of the Bones in Cretins under Thyroid Treatment. (*The Lancet*, October 2, 1897.) By T. Telford-Smith, M.A., M.D.

The author calls attention to the fact that the rapid growth of the skeleton under thyroid treatment leads to a condition of softening of the bones which results in a yielding and bending of those which have to bear the weight. These conditions are most manifest in the tibia and fibula. He calls attention to the observations of Hoffmeister and von Eisenberg, who succeeded in inducing rickets in rabbits, sheep, and goats by the removal of the thyroid gland. In rickets, however, there is a delayed and perverted ossification, while in cretins under the thyroid treatment there occurs a rapid development of the bones. The article contains typical photographic illustrations of the condition described. The writer recommends that all cases be carefully observed while under treatment, and, if any tendency to bending manifests itself, that the patient be kept from walking for a time or that the legs be supported by light splints. In addition to this the child should have plenty of sunlight and fresh air and a generous diet.

S. McC. Hamill.

Ovariotomy in a Child Thirty-three Months Old. (*American Journal of Obstetrics and Diseases of Women and Children*, September, 1897.) By C. S. Hoffman.

On November 6, 1895, a child aged thirty-three months complained for the first time of pain in her abdomen, which lasted two hours. She seemed well for the next three days, when she commenced complaining again of pain. Two days later the abdomen began to swell and she was feverish. The condition of the child at the first examination was as follows: temperature 103° F.; pulse 135; respiration hurried and shallow. The child vomited all food. Her bowels had not moved for several days. There were very perceptible fulness and hardness of the abdomen, which was distended and drum-like; on the left side there was dulness, extending from the ilium to the ribs and from about two inches to the right of the umbilicus down to the pubic symphysis. To the right and above this dull area there was tympanites. Hot applications to the abdomen and small doses of calomel caused the bowels to move the next day and the stomach to become more retentive. The action of the kidneys was normal. Gradual improvement followed. By the middle of December she was able to be

around the house. By the end of December she was considered fully recovered. In the early part of February the mother reported that the child had been having a discharge of blood from the vagina at stated periods ever since her illness. The child's breasts were enlarged and the external genitalia much developed. In April the parent reported that the child had been complaining of pain in the abdomen for three weeks and that the abdomen had begun to enlarge. The mother thought that there had been some slight fulness in the abdomen ever since her first illness in November. The child was anemic. Her face had an anxious expression and her features were pinched. Pulse 120; temperature normal. Under anesthesia she was found to have a liquid-containing tumor in the abdominal cavity. Enlargement was chiefly on the left, beginning low down in the pelvis and extending up to the ribs and three inches to the right of the umbilicus. A diagnosis of ovarian tumor was made. The temperature was at this time 101.5° F., pulse 135, with some cough and slight bronchitis. The great distention of the abdomen interfered with the respiration. Stomach very irritable. The child became rapidly worse from this date, and on the 18th of April was operated upon. A tumor, containing from six to eight pints of liquid, weighing from eight to ten pounds, was removed. There was extensive adhesion between the tumor and the parietal peritoneum. A microscopical examination of the tumor by Dr. Dobson, of the Johns Hopkins Hospital, showed it to be a cystic sarcoma. A review of the literature revealed the fact that only three operations for the removal of ovarian tumor had been performed on a child younger than the patient referred to, and those were for the removal of dermoids. This case, therefore, stands unique.

S. McC. Hamill.

FORENSIC MEDICINE.

IN CHARGE OF LORENZO D. BULETTE,
Of the Philadelphia Bar.

EMERGENCY PRACTICE DEFINED.

As the medical acts of the various States, almost without exception, specifically exempt from their provisions various persons, such as the board of physicians and surgeons of the army and navy and medical schools, and also unqualified persons rendering medical assistance in cases of emergency, it frequently happens, in prosecutions of persons for illegal practice of medicine, that it becomes necessary for the courts to ascertain the legal import of the term emergency. A case[1] arose under the medical act[2] of

[1] The People *vs.* Lee Wah, 71 Cal. 80. [2] Statutes, 1875–76; statutes, 1877–78.

California in which an herb doctor was prosecuted for practising his art successfully on two women after the regular physicians had failed. The jury having returned a verdict of guilty, the defendant appealed to the Supreme Court and sought to shield himself from the penalty of the medical act by contending that the circumstances under which he administered his herbs constituted an emergency. But the Supreme Court decided that the mere fact that a sick person has been given up as incurable by physicians of the schools provided for by the medical act does not create such an emergency as authorizes a person, who has not procured a medical certificate, to render him gratuitous services, declaring the emergency contemplated by the act to be cases in which the ordinary and qualified practitioners are not readily obtainable.

The uncontradicted facts of the case, as they appear from the evidence, are, that the defendant had a place of business in J., at which he kept herbs. Two women (called as witnesses for the prosecution) went to his place of business, stated to him their ailments, and asked if he could give them herbs to effect a cure; he said he could, and prepared herbs of his own selection and delivered them to the women, who took the herbs to their homes and made and drank teas. They paid him at times ten dollars per week; at other times six dollars per week; the payments were made regularly without reference to the kind or amount of herbs, and continued several weeks—in one case ten weeks. The women testified that they did not pay him for medical services, but for the herbs only.

At the request of the defendant the trial court instructed the jury that if they believed the services testified to were rendered gratuitously and were rendered in each particular instance in case of emergency, a verdict of not guilty should be rendered. The court then proceeded to define "an emergency," within the meaning of the statute (which declares that nothing therein contained should be construed to prohibit gratuitous services in cases of emergency), as follows:

"The question is, What is an emergency? Two ladies have testified before you and stated that their condition was deplorable; that they consulted in vain other physicians, and that they regarded themselves and were regarded by their friends and physicians as incurable; and that they repaired to this defendant as a last resort. The ladies stated upon their part it was an emergency, an exigency in which death on the one hand and submitting themselves to that treatment on the other were the only alternatives. I instruct you that the emergency contemplated by the statute is not such as this case suggests. It means a case in which the ordinary medical practitioners of the schools provided for by the statute, who are provided with the proper diplomas, and submitted themselves to the proper examination, are not readily obtainable. That is an emergency where the exigency is of so pressing a character that some kind of action must be taken before such parties can be found or procured. The jurors will readily understand that if a person has received an injury in a remote, iso-

lated part of the country, in which some person not a regular practitioner should be called upon to render immediate assistance, and should render it, as in the case of a severe injury, a case of obstetrics, or the like, such instance would be an emergency, which would justify a party in rendering assistance, and that humanity and decency would require that he should not be liable to a criminal prosecution for so doing. So some person might get hurt, or faint, or fall in a fit in the street, and a person might render him assistance and thus relieve him from pressing danger. We all understand that is an emergency. In that case no party should decline to render assistance, or be criminally prosecuted for so doing. If, however, a party is satisfied that another school of physicians or another individual can render him more effective aid, more beneficial services than others, and he therefore seeks his aid, that is not such an emergency as the statute contemplates."

Against these instructions it was urged, on appeal to the Supreme Court, that they are contradictory. But that court, speaking by Mr. Justice Mayrick, said: "The court left with the jury the question as to whether medical services were rendered gratuitously or for pay; and in effect told them if services were rendered gratuitously and in an emergency, they should acquit, but that the circumstances detailed in the testimony did not constitute 'emergency' within the meaning of the statute. We see no contradiction. The evidence was sufficient to justify the verdict." And the judgment entered thereon against the defendant was accordingly affirmed.

BOOK REVIEWS.

A System of Practical Therapeutics. Edited by Hobart Amory Hare, M.D., Professor of Therapeutics and Materia Medica, Jefferson Medical College, Philadelphia. Vol. IV., with Illustrations. Philadelphia and New York: Lea Bros. & Co. 1897.

The previous volumes of this system have been already, for several years, before the profession. The present one, although to be regarded as supplementary to the three preceding it, is complete in itself, and presents its readers with a concise statement of the recent advances in therapeutics.

The volume opens with a chapter on hydrotherapy, by Dr. Baruch, of New York. The studies of Winternitz and others, he says, warrant the statement that general cold applications to the surface of the body, provided they are not too prolonged, increase the number of the corpuscular elements in the circulation, both the white and the red, and the quantity of the hemoglobin; they also increase the "tone" of the muscular coats of the vessels, and stimulate the heart's action, thus raising blood pressure. In speaking of the treatment of typhoid fever by this method he insists on the recognition of Brand's idea, that the cold bath does not aim merely at the reduction of temperature, but that its chief object is the effect obtained on the circulation and the nervous system.

The value of this method of treatment in many forms of neurasthenia is emphasized.

In a very practical paper Dr. Tally, of Colorado Springs, discusses the modern treatments of phthisis. He is not enthusiastic over any of the specific methods of treatment. Tuberculin he considers to be, as yet, of very doubtful value, and only in the experimental stage, nor can more be said, for the present, of serum therapeutics, antistreptococcal injections, or nuclein treatment. Speaking of creosote, he says that, although it still continues to be extensively used, opinion is against its employment in acute febrile and erethitic cases; moderate doses only should be administered. Even under the most suitable conditions it is apt sooner or later to induce symptoms of gastric irritation. Dr. Tally places considerable value on strychnine given in large and increasing doses, according to the methods of Dr. I. J. Mays. The climatology of the disease receives full attention.

The chapter on syphilis is written by Dr. Ed. Martin. This writer recommends inunction as the best method of conducting mercurial treatment. When this is impracticable he administers it by the mouth, and gives the preference to the protoiodide, the pill of mercury, and mercury with chalk. The constitutional treatment should be inaugurated as soon as a probable diagnosis can be made, and he confidently recommends the excision of the chancre as the first step in treatment.

Dr. Anders, writing of the treatment of typhoid fever, insists on a much longer time than is generally deemed necessary for the complete disinfection of typhoid stools by either a mercuric solution or a five-per-cent. solution of carbolic acid. Great care should be exercised about the person of the patient and about his bed-linen to prevent dissemination of the bacilli. Speaking of intestinal antiseptics, this writer says that the use of this class of remedies does not constitute a specific mode of treatment except in the imaginations of their warmest advocates. Dr. Anders is a strong advocate of the Brand method, but when this cannot be employed, and high fever, with decided nervous symptoms, is present, internal antipyretics used continuously are allowable.

The latest thoughts on the therapeutics of scarlet fever, measles, and influenza are presented in a chapter by the editor.

Dr. Fletcher Ingalls presents an interesting chapter on the best methods of treating the various affections of the nasal passages, and Dr. D. Braden Kyle one on the diseases of the pharynx and larynx; both are well illustrated and very practical.

Dr. W. H. Park, of the New York City Health Department, writes the article on the treatment of diphtheria, in which he emphasizes the value of diphtheria antitoxin, and gives us a very interesting series of statistics in connection with its use. In regard to the antistreptococcus serum he writes that as yet it is very weak in curative power, but it may at any time become sufficiently improved to have practical value. For local applications he prefers the least irritating. For the nostrils irrigation with a tepid salt solution, and for the mouth and pharynx either a 1 : 4000 bichloride-of-mercury solution, or a five-volume peroxide-of-hydrogen solution may be employed.

The treatment of asthma, bronchitis, and whooping-cough is discussed by Norman Bridge, of Chicago. In the treatment of whooping-cough, he emphasizes the necessity of securing good hygienic conditions, and advises the use of quinine pushed to the verge of cinchonism in those cases where it does not appear to disturb, and the avoidance of anodyne drugs except under the stress of some emergency. The modern methods of treating pleural effusion and empyema, abscess and gangrene of the lung, and pneumonia are very fully discussed by Dr. McCosh and Dr. Herrick.

Dr. Fred. T. Henry, of Philadelphia, writes on the important subject of Diseases of the Heart. He considers that the salicylic acid treatment of rheumatism appreciably lessens the chance of endocarditis supervening, and even in those cases in which its presence has been recognized, he advises the continuance of the drug in full doses, but associates with them moderate doses of one of the alkaline salts. Locally, he recommends the application of an ice-bag over the precordium immediately on the appearance of any symptoms indicating involvement of the endocardium. This may be followed in twenty-four hours, either by leeching or a blister, or, should marked improvement have taken place, by a belladonna plaster. Careful directions are given as to the after-treatment of endocarditis. The Short method is fully described, but the writer has had no personal experience with it. The action of digitalis is discussed at length and full instructions for its use are given. This chapter is a particularly valuable one.

Among other papers that of Dr. Meltzer, on Diseases of the Thyroid and Thymus Glands, Myxedema, Cretinism, Graves' Disease, and Obesity, claims attention and is thoroughly up to date. Diseases of the Stomach are discussed by Dr. Thos. Ashton. Dr. G. R. Fowler, of New York, writes the article on Peritonitis and Appendicitis; Dr. Joseph M. Matthews that on Diseases of the Rectum and Anus; Dr. W. W. Johnson, of Washington, describes Diarrheal Diseases and Dysentery. The Treatment of Nervous Diseases is discussed by Dr. T. Collins, of New York, Dr. F. X. Dercum, of Philadelphia, and Dr. Patrick, of Chicago, while Dr. N. S. Davis, Jr., writes on Renal Diseases.

In addition to the above the work contains chapters on diseases of the skin, genito-urinary disease, and affections of the eye and ear.

We can testify to the clear, practical, and exhaustive manner in which the various papers have been written. The volume is illustrated whenever it has been deemed desirable.

A. D. BLACKADER.

SPINAL CARIES (SPONDYLITIS, OR POTTS' DISEASE OF THE SPINAL COLUMN). By Noble Smith, F.R.C.S. Ed., L.R.C.P. London. Second Edition. 8vo. Pp. 153. London: Smith, Elder & Co. 1897.

In the second edition of this well-known monograph on spinal caries Mr. Smith has corrected some errors, supplied an index, described a new form of head piece for cervical disease, and added some remarks upon forced reduction of the deformity of caries under chloroform. The belief in the curability of spinal caries expressed in the first edition has been further confirmed by subsequent experience, the success depending, above all things, upon the accurate support of the spine. The occurrence of "lateral deviation of the spinous processes" in caries and other conditions has again been emphasized, and the attention of English and continental surgeons is particularly called to the importance of this subject. The illustrations of this subject are particularly good. Tuberculosis, as the essential cause of spinal caries, is clearly stated, and great stress is laid upon the importance of recognizing the local nature of the affection, and combating it before it has become general. The occurrence of high temperature in caries is referred to, and the effect of well-fitted apparatus upon the temperature is beautifully shown in an appended temperature chart. In the use of an adaptable mental splint invented by his colleague, Mr. Chance, the author treats his cases more after the manner of the American surgeons than do his colleagues. In this he is to be congratulated. The reference to Dr. Calot's method is timely and important, and we are pleased to see that he never has attempted to separate the diseased parts by any great force, but has aimed at improving the whole position of the back, chiefly by altering the curve

above and below the seat of the disease. It is with pleasure that we observe that the conservative American surgeons have been chary to adopt a heroic treatment which was popular in the days of Ambrose Paré, and which disappeared under the powerful influence of Sir Percival Potts and his followers but little over a century ago.

J. K. Y.

PRACTICAL DIAGNOSIS: THE USE OF SYMPTOMS IN THE DIAGNOSIS OF DISEASE. By Hobart Amory Hare, M.D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia; Laureate of the Medical Society of London, of the Royal Academy in Belgium, etc. New (2d) and revised edition. In one octavo volume of 598 pages, with 201 engravings and 13 full-page colored plates. Cloth, $4.75. Philadelphia: Lea Brothers & Co., Publishers.

The appearance of a second edition of Dr. Hare's Practical Diagnosis is an evidence of the practical value and appreciation of the book. All the refinements of diagnosis are carefully described in accordance with the best of modern methods. A single criticism may be made in reference to the blood test for typhoid fever by Widal's method. Dr. Hare says, "It will be noticed, if the patient is suffering from typhoid fever, that the typhoid bacilli rapidly form clumps." This statement needs qualification, for exceptional cases occur in which the blood from a typhoid fever case will fail to react, even when tested several times throughout the course of the disease by experts.

Such a case we have met with, and a warning should be given not to rely too implicitly upon the negative test when other symptoms of typhoid are present. At the last meeting of the Association of American Physicians held in Washington, Dr. A. C. Abbott reported that of 115 instances, accompanied with satisfactory clinical histories in which he had made the Widal test, 68 were typhoid fever clinically. The laboratory diagnosis by the blood test corresponded with the clinical diagnosis in 66 of the 68 cases. Dr. William Osler reported correspondence in 41 out of 44 cases. Dr. George B. Shattuck reported the reaction absent in only one case out of 125. We would suggest mention of these facts and the insertion of the following qualifying note:

"The test is not likely to yield positive results before the fourth or fifth day of an attack of typhoid fever.

"A negative result, obtained with the serum of a case of suspected typhoid, affords a *presumptive* evidence against the diagnosis of typhoid fever, but this is only a *probability*, especially if the examination has been made in the first few days of the disease. The examination should then be repeated during the next few days. The presumption that a case in which a negative result has been obtained is not typhoid, becomes correspondingly stronger as the stage of the disease becomes more advanced."—Widal.

G. H.

ABOUT CHILDREN: SIX LECTURES GIVEN TO THE NURSES IN THE TRAINING-SCHOOL OF THE CLEVELAND GENERAL HOSPITAL IN FEBRUARY, 1896. By Samuel W. Kelley, M.D., Professor of Diseases of Children in the Cleveland College of Physicians and Surgeons. 180 pages. Price, $1.25, *net*. Cleveland: The Medical Gazette Publishing Company. 1897.

These lectures treat of various matters connected with the nursing of children, and are intended primarily for nurses, although, as the author states, they are suitable for parents and even medical students and practitioners as well. They are written in a style both interesting and clear, and the amount of information contained in them is surprising.

The volume is evidently, however, not meant to be a guide for the general care of infants and children, since some of the subjects properly discussed in such books are omitted altogether. Consequently, as the only book of reference for mothers, it is unsuitable. It is rather adapted for trained nurses who have already received instruction in more elementary matters.

The author has endeavored to teach nurses not only the *how* of the nursing of children, but the *why* also, on the ground that greater usefulness can be attained by them in this way. Following these lines, Dr. Kelley discusses in the first chapter the peculiarities in the anatomy of the child, and in the second chapter the physiology and the development. After this are remarks on a few of the diseases and on the management of some of the accidents incident to infancy and childhood. Chapter IV. is upon symptoms and their interpretation. It is a rather long one, in which the color of the skin, the tongue, the attitude, the pulse, respiration, temperature, etc., are very satisfactorily considered. Following this is a section upon nursing and general management of sick children, which treats of a somewhat heterogeneous group of subjects not very systematically arranged; such as the caution to be employed in giving certain drugs, the use of electricity, the employment of disinfectants in infectious diseases, the application of splints, and the nursing of cases of harelip. The last chapter first discusses the artificial feeding of children and the preparation of milk. This might be much extended with advantage, particularly what is said about pasteurizing milk. It closes with some very practical remarks upon the disposition of children, with advice upon the method of gaining a child's confidence. This we especially commend to all nurses' careful consideration.

The contents of the book form interesting and instructive reading, collateral to other text-books upon the nursing and management of children, and we heartily commend it for this purpose. As the author himself states in his preface, it "lays no claim to being a complete treatise."

J. P. C. G.

Essentials of Bacteriology. By M. V. Ball, M.D. 218 pp., 12mo. $1.00. Philadelphia: W. B. Saunders. 1897.

The third edition of Dr. Ball's book, issued recently, contains a concise description of this subject and meets with continued favor as a hand-book for the laboratory. He gives a table containing the characteristics of about two hundred and seventy-five of the principal bacteria. Dr. Ball should add, in another edition of his book, some description of the pathogenic spirilla which have been recognized in the Schuylkill River by Dr. A. C. Abbott and Dr. D. H. Bergey, and have been reported to the Association of American Physicians. The importance of this discovery lies in the fact that these organisms might be readily mistaken for the genuine cholera spirillum, especially if there should be, at the same time, cases of suspicious intestinal disorder in the neighborhood. The investigation being made, however, at a time when there is no cholera in the country and has not been for years, shows the desirability of a more extended knowledge of the nature and distribution of the spirilla in our American surface streams.

We, also, are glad to see that due credit is given to Dr. Samuel G. Dixon for an announcement, in 1889, of the discovery of a method of curing tuberculosis in guinea-pigs with products obtained from the bacillus of tubercle, a year before Koch made his announcement on the same subject.

We note that the word "Chamberland" appears on page 101 as "Chamberlain," although in other portions of the book it has its proper spelling.

G. H.

TRANSACTIONS OF THE COLORADO STATE MEDICAL SOCIETY, 1897.

This is a volume of four hundred and seventy pages, containing the proceedings for the year. There are valuable papers in this issue by Drs. S. G. Bonney, Leonard Freeman, and C. D. Spivak. Dr. Spivak has shown great energy in carrying out a plan for a medical library in Denver, Colorado, through the coöperation of physicians who have libraries of their own, and, at the meeting of the State Medical Society, he gave a remarkable exhibit of rare old medical works and modern books, among which was a very creditable exhibit of Coloradoana. The members of this society have raised about sixteen hundred dollars for the Rush Monument Fund.

THE MEDICAL NEWS VISITING LIST FOR 1898. Weekly, dated, for 30 patients; monthly, undated, for 120 patients per month; perpetual, undated, for 30 patients per week per year, and perpetual, undated, for 60 patients per week per year (without text). The first three styles contain 32 pages of text and 160 pages of blanks. The 60-patient style consists of 256 pages of blanks. Wallet-size, flexible leather cover, pocket, and pencil. Price, in any style, $1.25. Philadelphia and New York: Lea Bros. & Co.

This list is well adapted to the needs of the profession. It is substantial, without being bulky, and contains some "therapeutic reminders" that may prove valuable in an emergency. The list has enjoyed a wide popularity.

TRAUMATIC INJURIES OF THE BRAIN AND ITS MEMBRANES; with a Special Study of Pistol-Shot Wounds of the Head, in their Medico-Legal and Surgical Relations. By Charles Phelps, M.D., Surgeon to Bellevue and St. Vincent Hospitals. New York: D. Appleton & Company. 1897.

This is a work of five hundred and eighty-two pages and forty-nine illustrations. It consists of three distinct parts: I. General traumatic lesions; II. Pistol-shot wounds of the head, and an appendix containing the "Condensed histories of three hundred intra-cranial traumatisms." Two hundred and thirty pages are devoted to the first, one hundred and sixty-five to the second, and one hundred and eighty-seven to the third section.

The preface states that the work is designed to be a concise and systematic exposition of the injuries which the brain suffers from external violence. This the author certainly has accomplished and in a quite satisfactory manner. He also states that it is based on an observation of five hundred consecutive cases of recent occurrence. This being so, the author is justified in speaking with an authority which will command the respect of the reader. When, however, he states that "the generalizations which have been made, and the conclusions which have been reached, from clinical observation, have been verified in each instance by necroscopic examination," he tends to give the impression that all his statements are facts, whereas some are opinions, with which at least some surgeons will be found to disagree. Still, in the main, he is conservative and thoroughly reliable.

The first portion is devoted to cranial fractures. He points out the extremely insignificant part played by fractures by *contrecoup;* also that the usual basic fracture unquestionably extends between the region in which primary injury is received and the corresponding basic fossa of the same side, a fact that surgeons are entirely too often in ignorance of. Hemorrhages from the ear are regarded as almost pathognomonic of fracture; not every one, however, will feel so confident on this point. Implication of the optic nerve is found to be followed by atrophy within fifteen days of the injury. The author gives as a new sign of basic fracture an acute localized pain, different from the frontal, occipital, or

diffused headache which is common in all forms of intracranial lesion. In treatment exploratory operations in doubtful cases are advised, and to make an opening for the elevator a burr-drill is used in preference to the trephine, which he says is only occasionally required. "Concussion" is a term not used, "contusion" having been substituted for it, thereby following the Germans. Symptoms are said to be without exception the result of a demonstrable organic change. The value of temperature as a symptom is quite carefully discussed. It is stated to be an almost absolute means of diagnosis in cases of fracture and alcoholism. The use of the ice-cap is strongly insisted on, and morphia is recommended as a sedative. The importance of *free* purgation is hardly insisted on enough; the use of mercurials is ignored. Want of space forbids further references, but the whole article teems with valuable practical points and cannot be too highly commended. The part comprising pistol-shot wounds is of less interest to the surgeon, but contains much valuable material for reference. The author states that it "is especially designed for the use of the legal profession in more precisely estimating the proper weight to be given expert testimony in cases of this character." We can hardly agree with him in allowing that a lawyer is the proper judge of medical facts. The third portion of the book gives the detailed histories of three hundred cases of injuries to the brain and its membranes, of which two hundred and twenty-five were verified by autopsies. It is an extremely valuable collection.

The book, taken as a whole, is an exceptionally able one, and should be in the library of every practising surgeon. It is not a repetition but an additional contribution to surgery. The author's style is clear and concise. The paper and typography are excellent, but the publishers have followed out the reprehensible custom of making a book about twice as large as there is any necessity for. It is to be hoped that in the near future we may have monographs put on the market at a price proportionate to the legitimate size of the work.

G. G. D.

A Text-Book of Special Pathological Anatomy. By Ernst Ziegler, Professor of Pathology in the University of Freiburg. Translated and edited from the Eighth German Edition by Donald Mac Alister, M.A., M.D., Linacre Lecturer of Physic and Tutor of St. John's College, Cambridge, and Henry W. Cattell, M.A., M.D., Demonstrator of Morbid Anatomy in the University of Pennsylvania. Sections I.–VIII. Pages 575. Index, pp. xxxii. 1896. Sections, IX.–XV. Pp. 579 to 1221. Index, pp. xxxi. New York: The Macmillan Company; London: Macmillan & Co., Ltd. 1897.

In accord with the German edition the book is divided into 15 sections, embracing 121 chapters and, as above indicated, 1221 pages in all. The sections include in order the following: Sec. I., Blood and Lymph. Sec. II., The Vascular Mechanism. Sec. III., Spleen and Lymph-glands. Sec. IV., Osseous System. Sec. V., Muscles and Tendons. Sec. VI., Central Nervous System. Sec. VII., The Peripheral Nervous System. Sec. VIII., The Skin. Sec. IX., Alimentary Tract. Sec. X., The Liver and Pancreas. Sec. XI., Respiratory System. Sec. XII., Urinary Organs. Sec. XIII., The Genital System. Sec. XIV., The Eye. Sec. XV., The Ear.

In reviewing the work of so distinguished a master as Professor Ernst Ziegler, when the volume is presented to us as a translation, the first question which arises in the reviewer's mind is whether he is justified in reviewing, from a critical stand-point, the opinions and method of arrangement of the original book and its prototype, the present English edition. The almost unprecedented

success which greeted the volume and which has followed the successive German editions of this book should be considered by even the most courageous reviewer, before attacking even the present volumes upon the basis of the original. That the critical teachers of the continent have accepted as satisfactory the original arrangement and the author's beliefs, could not be better attested than by the demand for eight editions in the brief period of approximately sixteen years. An opinion of a reviewer contrary to the verdict of a large mass of admittedly competent judges would be not only hypercritical, but, particularly in this case, unwise and unjust.

What of the present translation? The now very old translation of Ziegler which began in 1881 and appeared in three parts, the first in 1882, the second in 1884, and the third in 1886, met with the most cordial reception by teachers in England and other English-speaking countries. The criticisms at that time were based largely upon the disparity of the three parts, depending upon the long intervals between their appearance, and the fact that a part appearing four years after another part represented largely a more advanced view than the earlier publication. The publication of the present work, one volume immediately following the other while dated in different years, with but a few months intervening, gives us the two parts appearing practically simultaneously. The re-arrangement adopted in the later German editions has constructed a book upon entirely different lines than those which appear in the earlier German editions, and for this reason the present volumes bear almost no resemblance to the first English translation. The present translation, so far as the writer has been able to determine, is a conscientious reproduction of the original. The somewhat verbose German has been successfully converted into most readable English. The spelling is that of England rather than America, as is shown by "connexion," "neighbourhood," etc. Verbosity is often a mark of learning, and, while it is not improbable that the skilled translators could have condensed without loss, they have adhered, to a marvellous degree, to the original construction.

The bibliography is fairly complete and in most cases fully up to date, as is shown by a reference to an 1897 article on the suprarenals, p. 974. We must confess that we fail to see the necessity or wisdom of translating the titles of papers, nor do we see the reason for sometimes making the translation and sometimes omitting to do so. This is, of course, minor.

The total number of illustrations is 562. They are of the same quality that has so long obtained in the successive German editions. Many are printed in color and, what is rather unusual, the color is well selected. The tendency in not a few recently published works on medical subjects is to give the colored plates a polychromatic effect more gratifying to the printer than to the author. The present volumes are largely free from this objection; but Fig. 463, page 911, is, in our experience, open to this criticism. It is, however, an exception. The illustrations in black are most praiseworthy, and but few, probably less than ten per cent., are indistinct, poor reproductions, such as Fig. 205, page 187. There is no book in the easy reach of the student so fully illustrated and with better judgment.

The typography is most satisfactory. The use of antique, display, or broad-faced type to mark distinctive points has long been recognized as a method of rendering subjects and data easily located and therefore a valuable aid in books of reference. By binding the one book in two volumes, convenience in size, handling, and durability, and inconvenience in indexing and reference, both direct and crossed, are approximately balanced. We cannot avoid thinking that a complete index at the end of the second volume would have been useful.

As at present arranged, one not uncommonly must look through the index of each volume in order to find all the references.

The present addition to the literature of pathology will be most useful and greatly appreciated by English-speaking teachers and students.

W. M. L. C.

NOTICE.

The International Medical Magazine will hereafter be edited by Walter L. Pyle, A.M., M.D., of Philadelphia.

Manuscripts, exchanges, books for review, subscriptions, whether new or old, etc., should be sent to the International Medical Magazine, 1831–33 Chestnut Street, Philadelphia, Pa.

International Medical Magazine Co.

INDEX

TO

INTERNATIONAL MEDICAL MAGAZINE,

Volume VI.

1897.

The figures referring to the original communications and clinical lectures are printed in *heavy-faced* type.

A.

Abdomen, viscera of, tamponing in operations on, 499.
Abrin intoxication, histological changes produced by, 784.
Abscess of right temporosphenoidal lobe, 511.
recto-pharyngeal, 223.
Acid, hydrochloric, hypersecretion of, 492.
Acromegaly, skiagraphy in diagnosis of, 58.
Addison's disease, lectures on, 136.
Adrenal bodies, rôle of, in resisting infection, 217.
Advertisements, how some magazines get their, 382.
Albuminuria following tuberculous knee cured by amputation, 211.
interm ttent, 663.
Albumoses, absorption of, in the rectum, 207.
Alexander-Adams operation, technique of, 519.
Alexander-Kocher operation, 454.
Alvarenga prize of College of Physicians of Philadelphia, 744.
Amebæ, intestinal, semeiologic and pathogenic value of, 47.
American Medical Association, Semi-centennial meeting of, 318.
Product Company, 320.
Public Health Association, 382, 745.
Ammonium hydrate, fatal poisoning by, 383.
Andrews, Joseph A., M.D., tubercle of the iris, **471.**
Anesthesia, progress in, in 1896, 75.
Anesthetic, new local, holocain, 719.
Aneurism, aortic, pathology and therapy of, 197, 773.
of left ventricle, symptoms of, 200.
of right posterior aortic sinus of Valsalva, **258.**
treatment of, by subcutaneous injection of gelatin solution, 773.
Anti-ricin, action of, 290.
Antiseptic midwifery, 152.
Antitoxin, diphtheria, antitoxic unit of, 140.
Anus, artificial, in inguinal hernia, spontaneous production of, 277.
Aphasia, typical associated movements of right arm with, 213.
Apophysary ligatures, 438.
Appendicitis as an epidemic infectious disease, 135.
Arthritis, acute rheumatic, surgical treatment of, **702.**
Aseptic surgical operations performed with cotton gloves and a mouth-protector, 673.
Ataxia, causes of, in tabes dorsalis, 727.
cerebellar hereditary, 364.
Athetosis, case of fatal, 441.
Atrophy, facial, 359.

B.

Baby-farms, 537.
Bacilli, colon group of, influence of environment upon biological processes of, 729.
of diphtheria and of pseudo-diphtheria, 291.
Bacillus aërogenes capsulatus, infection by, 447.
diphtheria, rapid diagnosis of, 220.
Eberth's, detection of, in feces, 217.
icteroides and yellow fever, 517.
of septicæmia hæmorrhagica in an infected wound, 730.
pyocyaneus, chromogenetic action of, 445.
pigmentary function of, 151.
typhoid, study of, 218.
Bacteriological examination of the stools in typhoid fever, 731.
Bacterium coli in infantile diarrhea, virulence of, **1, 85.**
Banks, William Mitchell, F.R.C.S., the surgeon of old in war, **577.**
Basedow's disease, treatment of, by resection of cervical sympathetic, 439.

Baths, heart changes from, 762.
Beck, Carl, M.D., the Röntgen rays in surgery, **211.**
Bee, poison of, 292.
Beer bottles as receptacles for urine, 240.
Behrens, B. M., removal of the drumhead and malleus in cases of negative Rinné, **204.**
Bell, Robert, M.D., treatment of carcinoma of the uterus, and ovarian disease, without operation, **332.**
Benedict, A. L., M.D., some so-called diagnostic points of gastric carcinoma, **181.**
Bicycle, the, for women, 685.
Biggs, Herman M., M.D., address on public medicine delivered before the British Medical Association, **591.**
Bile-ducts, diseases of, 354.
Bladder, absorptive power of, 492.
exstrophy of, congenital, 508.
female, hair-pin in, shown by skiagraphy, 228.
stone in, detection of, by aid of phonendoscope, 54.
Blindness, hysterical or functional, 515.
Bliss, Arthur A., M.D., foreign body (iron staple) in the esophagus, removed after having been located by means of the Röntgen rays, **83.**
Blood, agglutinating power in, of typhoid patients, 788.
condition of, in the cachexia of carcinoma, **404.**
Board, by order of the, 462.
Bones, inflammation of, after an attack of cholera, 755.
Book Reviews. *See* Reviews.
Brain, pre-frontal region of, symptomatology of gross lesions of, 57.
tumor of, removal of, 147.
Bratton, Dr. W. D., death of, 745.
Breast, tumor of, containing cartilage and bone, 785.
British Medical Association, Montreal meeting of, 542, 635.
Bromoform poisoning, 224.
Bubonic plague. *See* Plague.
Burnett, Charles H., M.D., intra-tympanic surgery, especially in chronic purulent otitis media, 749.
Burns, superficial, visceral pathological alterations resulting from, 440.

C.

Canada, its medical life and resources, **558.**
Cancer, oöphorectomy in treatment of, 733.
treatment of, by injections of pure yeast, 716.
Carbolic acid, poisoning by, 744.
Carcinoma, cachexia of, condition of the blood in, **404.**
of cervix uteri in a girl of fourteen, 68.
of pharynx, and its extirpation, 721.
of rectum, treatment of, 767.
of stomach, 192, 193.
some so-called diagnostic points of, **181.**
Carotid, internal, fatal bleeding from erosion of, 298.
Cattell, Henry W., A.M., M.D., aneurism of the right posterior aortic sinus of Valsalva, with rupture, **258.**
Cattle plague, cause of, 447.
Centre for locomotion in the region of the pons, 279.
Cerebral cortex, centre for muscles of trunk in, 59.
degeneration, infantile, with symmetrical changes at the macula, 281.
muscular atrophy, 681.
Cerna, David, M.D., random notes on the second Pan-American Medical Congress, held at the City of Mexico, November 16, 17, 18, and 19, 1896, **337, 388.**
Cheyne, W. Watson, F.R.C.S., F.R.S., progress and results of pathological work, **626.**
Chloroform syncope, causation of, 436.
Cholera, diagnosis of, with chrysoidin, 346.
inflammation of long bones as a sequel of, 755.
inoculation against, 138.
lesions of the spleen in, 682.
Chorea, habit, 366.
in the aged, 679.
Chorion, malignant tumors of, 787.
Cirrhotic liver, 42.
Climacteric disturbances following castration, treatment of, 154.
ovarian tissue in treatment of, 68.
Climate, changes of, effects of, upon men and animals, **413.**
Clysters, absorption of fat from, 714.
Colon bacilli, influence of environment upon, 729.
Color inebriety and color therapeusis, 538.
Colpeurysis, intra-uterine, 689.
Conception after curettement of cervical carcinoma, 687.
Convulsion centre, so-called, in the region of the pons, 279.
Cranio-cephaloclasis, 687.
Cretinism, experimental, in dogs, cats, and birds, 288.
sporadic, 792, 795.
thyroid treatment of, 796.
bending of bones in, 797.
Cumston, Charles G., M.D., a study on the virulence of the bacterium coli in infantile diarrhea, **1, 85.**
Curtin, Roland G., M.D., clinical study of tachycardia and its relation to uremia and Graves's disease, **649.**
Cystadenoma of throat, 775.
Cystitis, urotropine for, 667.
Cysts, multiple, in small intestine, 65.

D.

Danforth, I. N., M.D., renal diseases as affected by climate, **655.**
Decidual sarcomata, 787.
Deformities, vertebral, 438.
Delivery, unconscious, of a twin-child, 80.
Dental decay, medicinal prevention of, 495.
Dermatoneurosis, erythematous hysterical, **695.**

Diabetes mellitus, the blood in, 189.
knee-jerks in, 680.
Diarrhea, infantile, bacterium coli in, **1, 85.**
Died at his post, 745.
Diphtheria antitoxin, antitoxic unit of, 140.
treatment of, with antitoxin serum, 48, 766.
Diphtheritic antitoxin serum, changes in, when filtered, 151.
Disinfectant, formaldehyde as a, 716.
Dispensary abuse in Philadelphia, 636.
Dissecting room, preservation of bodies in, **717.**
Double number, a, 637.
Drumhead and malleus, removal of, in cases of negative Rinné, **264.**
Duodenum, carcinoma of, diagnosis of, 350.
Dura, opening of, for cure of paralysis, 726.

E.

Eclampsia, etiology and therapy of, 521.
Emergency practice, legal definition of, 798.
Emphysema, general, followed by recovery, 669.
subcutaneous, complicating diphtheria, 449.
Empyema, chronic, treatment of, by decortication of lung, 196.
Encephalitis hæmorrhagica, primary acute, 148.
non-suppurative acute, 359.
Endometritis, malignant chronic, **163.**
puerperal, therapeutic use of steam in, 66.
Endometrium, regeneration of, after cauterization, 688.
Epilepsy, spinal, 56.
treatment of, by resection of cervical sympathetic, 439.
Epileptic convulsions, behavior of respiratory apparatus in, 763.
Ergot, plea for larger use of, in obstetrics, 452.
Erythematous hysterical dermatoneurosis, five cases of, **695.**
Esophagus, foreign body in, located by skiagraphy and removed, **83.**
Etiological experimental therapy, 665.
Eucaine hydrochlorate, physiological action of, 494.

F.

Fat, absorption of, from clysters, 714.
necrosis, experimental production of, 446.
Fecal tumors, 48.
Femur, fracture of neck of, in children, 434.
Fever, glandular, epidemic of, 155, 156.
recurrent sero-therapeutics in, 136, 138.
Fibroma of ovary and ovarian ligament, 453.
Fiske, Caleb, prize essay, 746.
Fistules, broncho-biliary, 491.
Fluoroscope in diagnosis of diseases of the thorax, 346.
Forceps, with adjustable axis-traction, 67.
Foreign body from the stomach of a boy, **481.**
Forensic medicine, progress of, in 1896, 75.
Forensic Medicine, Review of, 229, 303, 370, 525, 691, 736, 798.
Formaldehyde as a disinfectant, 716.
its chemistry in disinfection, 716.
Foy, George, F.R.C.S.I., the surgery of the prostate gland, **15.**

G.

Gall-bladder, diseases of, 354.
Gall-stones, chemistry of, 352.
surgical significance of, 210.
Gangrene, acute spreading, treated with antistreptococcic serum, 51.
hospital, 142.
etiology and lesions of, 53.
Gastroptosis, 662.
Gland fever, 156.
Glandular fever of childhood, 794.
Goitre, exophthalmic, treated by splenic medication, 432.
Gonococcus, successful cultivation of, on a new medium, 682.
Gonorrhea in women, pathology and therapy of, 228.
treatment of, with argonin, 212.
with large douches of potassium permaganate, 678.
with silver citrate, 212.
Gonorrheal inflammations of joints, bursæ, and tendon sheaths, 671.
Gout, a possible cause of, **344.**
arthritic, 191.
treatment of, by natural mineral waters, **645.**
Gynecology, chronic infected case in, treatment of, by general practitioner, 789.

H.

Health Department, San Francisco, 743.
of medical men, hints on preservation of, 159.
Heart, experimental injuries to, 723.
intra-cardial compression of, 294.
Heart-changes resulting from baths and gymnastics, as shown by the Röntgen rays, 762.
Heart-disease with pulmonary tuberculosis, 45.
Heart-murmurs, systolic, diagnosis of, 46.
Heath, Christopher, F.R.C.S., the teaching of surgery, **623.**
Hematoma vulvæ after labor, origin and treatment of, 525.
Hematoporphyrinuria, 660.
Hemiplegia, diabetic, 427.
in lead-poisoning, 146.
unusual case of, 512.
Hemorrhage, post-partum, injections of artificial serum in, 450.
Hemorrhoids, pathologic and clinical contributions on, 778.
Hernia, digestive disturbances caused by, 192.
ovarian, 368.
radical operation for, results of, 433.
Hinsdale, Guy, M.D., case of foreign body in the larynx ; death from suffocation, **21.**

Hip, congenital displacements of, treatment of, 435.
dislocation of, congenital, pathology and treatment of, 504.
luxation of, congenital, treatment of, by creation of ankylosis, 503.
Holmes, Edmund W., A.B., M.D., refrigeration as a means of preservation of bodies for use in the dissecting-room, **747.**
Holocain, the new local anesthetic, 719.
Hot air, physiological effects of local application of, 723.
Hot-air treatment of painful and partially ankylosed joints, 723.
Humor, aqueous, secretion and filtration of, 214.
Hunt, William, M.D., memoir of, **167.**
Hypermyotrophy, idiopathic arterial, 194.
Hyperostosis cranii, 60.
Hysterectomy, vaginal, by the clamp method, 299.
Hysteria simulating organic disease of brain, 514.

I.

Icterus, chronic, 794.
in pneumonia, origin of, 41.
Infant may sue for damages for injuries inflicted on him *en ventre sa mere*, 736.
Infants, hygienic feeding of, 366.
Infectious diseases, lesions of central nervous system in, 727.
Influenza, immunity against, 424.
International lepra conference, 712.
Intestine, myosarcoma of, 220.
Intra-tympanic surgery in chronic purulent otitis media, **749.**
Intra uterine medication, modern methods of, 66.
Intussusception, case of, 792.
of the ileum in an adult, case of, **755.**
Iodoform, absorption of, 670.
Iris, tubercle of, **474.**
Isolation in scarlet fever unnecessary, 791.

J.

Joint-affection after scarlet fever, 142.
Joints, painful and partially ankylosed, hot-air treatment of, 723.
stiff and painful, cured by superheated dry air, 211.

K.

Kidney calculi, internal treatment of, 349.
excretory ducts of, congenital dilatation of, 425.
Knee-jerks in diabetes mellitus, 680.
Knight, Frederick I., M.D., choice of a summer residence in New England, **385.**

L.

Laryngology and rhinology, progress of, 668.
Lead-poisoning, chronic, tabes dorsalis and, 727.
Lecturer, medical, of 1804, **120.**
Legal liability of physician whose wrongful diagnosis causes breach of marriage engagement, 370.
of third person calling in a physician, 691.
medicine. *See* Forensic medicine.
Lepra conference, international, 712.
Leucocytic degeneration of the blood in leukemia and anemia, 422.
Leukemia, 347.
acute, 489.
and the pathological histology of the blood and marrow, 731.
Liver, acute yellow atrophy of, in a boy of four years, 190.
cirrhosis of, experimental, 282.
cirrhotic, 42.
extract of, physiological action of, 495.
movable, sensation of painful pulling at a distance in cases of, 426.
new growth in, 226.
surgery of, 351.
Locomotor ataxia, treatment of, by elongation of spinal cord, 505.
Lupus of the extremities, 507.
Lymph-channels, tuberculosis of, 713.

M.

Mackenzie, Stephen, M.D., F.R.C.P., progress of medicine during the preceding two and a half centuries, **613.**
Malarial fever, period of incubation of, after serum treatment, 190.
Malformations, symmetrical, 223.
Mays, Thomas J., M. D., treatment of acute pneumonia, **397.**
Meat substitutes, 276.
Mediastinum, anterior, tumor of, 150.
Medical colleges, American, 743.
men, practical hints to, on preservation of their own health, 159.
schools, teaching in, more practical, 319.
services, gratuitous, to patients occupying private rooms in hospitals, 239.
Medicine, address in, before the British Medical Association, **543.**
Mongolian, 207.
progress of, during the preceding two and a half centuries, **613.**
in 1896, 70.
Review of, 41, 130, 186, 273, 346, 422, 489, 659, 712, 762.
right to practice, forfeited by conviction for felony, 525.
Medulla oblongata, origin and destination of certain afferent and efferent tracts in, 779.
Ménard's operation, 146.
Meningomyelitis, syphilitic, 147.
Mercury salicylate, local changes after injection of, 493.
Mescal intoxication, phenomena of, 715.
Metritis, septic, treated by antistreptococcic serum, 153.
Microscopical diagnosis, preparing stained sections for, 66.
work, infiltrating dental and osseous tissues for, 65.

Midwife, criminal negligence of, 80.
Milk inspection, 463.
Mississippi Valley Medical Association, 542.
Montreal meeting of the British Medical Association, 635.
Morton, Th mas G., M.D., memoir of William Hunt, M.D., **167.**
Moyer, Harold N., M.D., simple myositis as an occupation disorder, **403.**
Mumps, transmissibility of, from man to dog, 774.
Murmers, presystolic, at apex of heart, diagnostic importance of, 200.
Myocarditis, parenchymatous, in childhood, 225.
Myomotomy, indications for, 688.
Myositis, simple, as an occupation disorder, **403.**
Myxoma of labium majus, 688.

N.

Neale's Medical Digest, 82.
Nerve, trigeminal, origin of, investigations on 280.
Nerve cell, pathology of, 509.
Nerve fibres, medullated, staining of, 448.
Nerve-roots, cervical and thoracic, in relation to wry-neck, 781.
Nervous diseases, organic, as neuronic diseases, **33.**
system, central, lesions of, in infectious diseases, 727.
conducting element of, 782.
diseases of, relation of rheumatoid arthritis to, 713.
Neuritis, hemorrhagic, paralysis of one third nerve from, 443.
malarial, with tremors, 444.
Neurology, Review of, 56. 146, 213, 279, 359, 441, 509, 678, 726, 779.
Neurones, trophic functions of, 681.
New England, summer residence in, choice of, **385.**
Newton, Richard C., M.D., some personal observations upon the effects of changes of climate upon men and animals, **413.**
Notes and Notions, 239, 318, 380, 462, 537, 635, 743.

O.

Obstetrics and gynecology, progress of, in 1896, 72.
Review of, 65, 152, 226, 298, 366, 450, 519, 683, 732, 789.
O'Conor, John, M.A., M.D., surgical treatment of acute rheumatic arthritis, 702.
Oïdium albicans, modifications of serum of animals vaccinated against, 216.
Oliver, Charles A., M.D., a perfected series of test-type, **387.**
Oöphorectomy in treatment of cancer, 733.
Ophthalmology in Japan, 637.
progress of, in 1896, 74.
Optic neuritis, its localizing value in intracranial tumor, 678.
Os, external, dilatation of, 367.
division of, 367.
Osler, William, M.D., F.R.C.P., address in medicine delivered before the British Medical Association at Montreal, **543.**
Osteomalacia, lactic acid in the urine in, 349.
Osteomyelitis, vertebral, 54.
Otitis media, chronic purulent, **749.**
Ovarian disease, treatment of, without operation, **332.**
tumor with pregnancy, 683.
tumors, notes on, 789.
Ovaries, growths on, in pregnancy, 520.
Ovariotomies, a series of fifty, 789.
Ovariotomy, flushing without subsequent drainage of peritoneal cavity after, 452.
in a child thirty-three months old, 797.
Ovary, fibroma of, 453.
prolapsed into a hernial sac, 154.

P.

Pan-American Medical Congress, second, random notes on, **337, 388.**
Pancreas, tail of, primary sarcoma of, 42.
Paralyses, bulbo-spinal, spastic, atrophic, pathology of, 362.
Paralysis caused by compression from abscess, 725.
general, in two young sisters, 282.
infantile, epidemic of, 369.
oculomotor, periodical, 280.
of fifth nerve, 360.
paroxysmal, of epileptic nature, 362.
Paraplegia due to spinal caries, 146.
Parathyroid glands, 285.
Paresis, pseudospastic, with tremor, 361.
Pasteur, the work of, and the modern conception of medicine, **566.**
Pathological work, progress and results of, **626.**
Pathology, Review of, 62, 150, 282, 445, 516, 682, 728, 783.
Paulig, Frederick A., M.D., vaccination, 709.
Pediatrics, Review of, 689, 790.
Pemphigus neonatorum, 297.
Pennsylvania Medical Journal, 464.
Pericardial effusion, dorsal test for, 195.
Periorchitis, hemorrhagic, 506.
Peritoneal cavity, postural method of draining, after abdominal operations, 440.
infection, reaction to, mechanism of, 284.
Peritoneum, giant-celled growths upon, in connection with intra-uterine pregnancy, 520.
Peritonitis, acute general, etiology and pathology of, **22.**
septic, treated by antistreptococcic serum, 153.
Pharynx, carcinoma of, and its extirpation, 721.
Phillips, W. F. R., M.D., meteorological conditions of sunstroke, **465.**
Phonendoscope as an aid in detecting stone in bladder, 54.
Physiology, progress of, during the last thirteen years, 734.
Placard, the blight of, 380.
Plague, bubonic, 186.
inoculation against, 766.
treatment of, 203, 205.
epidemic in Formosa, 786.

Plague,
serum antipesteux treatment of, 720.
prophylactic fluid, 664.
spread of, 158.
Pleural effusions, experimental production of, 62.
Pleuritis, sinus, 424.
Pneumonia, acute, treatment of, 397.
croupous, uric-acid excretion in, 348.
icterus in, origin of, 41.
Poisoning by carbolic acid, 744.
by illuminating gas, 81.
Polymyositis acuta and acute articular rheumatism, 762.
Pons, tumor of, 59.
Post-mortem discoloration taken for bruise, 384.
Poultice, spice, 718.
Pregnancy, tubal, 519.
in an inguinal hernia, 154.
Premature infants, feeding of, 689.
Prevention of propagation of kind, 300.
Prize essay, Alveranga, 744.
Caleb Fiske, 746.
Profession, a dependent, 381.
Prostate gland, hypertrophy of, castration and vasectomy in, 500.
operative treatment of, 497, 500, 502.
surgery of, **15.**
Protoplasm, nervous structure of, 511.
Psittacosis, bacillus of, 215.
Public medicine, address on, before the British Medical Association, **591.**
Puerperal fever, prevention of, in hospitals connected with teaching institutions, 685.
serum treatment of, 524.
treated by antistreptococcic serum, 298.
infection, culture diagnosis and serum treatment of, 683.
Pulsation, systolic centrifugal venous, without tricuspid stenosis, 273.
Pulse, voluntary increase of frequency of, 199.
Pupil, rigidity of, in hysteria, 147.
Purpura hæmorrhagica, sarcomatosis with, 44.
Pyloric stenosis, incomplete, 659.
Pyogenic infection through the pharyngeal mucous membrane, 664.
Pyramidon, 52.

R.

Rachitis, pathogenesis of, 369.
Ransom, Charles C., M.D., treatment of gout by natural mineral waters, **645.**
Rectum, carcinoma of, treatment of, 767.
prolapse of, after operation for procidentia uteri, 688.
stricture of, tuberculous and syphilitic, 439.
Refrigeration as a means of preservation of bodies in dissecting-room, **747.**
Reichmann, symptom-complex of, 492.
Renal diseases as affected by climate, **655.**
Responsibility of surgeon for carrying an operation beyond the limits fixed by his patient, 229.
Reviews:
Abbott's Principles of Bacteriology, 455.
Allbutt's System of Medicine, 738.
American Text-Book of Physiology, 310.
Year-Book of Medicine and Surgery, 236.
Anders's Text-Book of the Practice of Medicine, 741.
Bailey's Diary of a Resurrectionist, 309.
Ball's Essentials of Bacteriology, 804.
Berger, Résultats de l'examen de dix mille observations de hernies, 77.
Bishop's Diseases of Ear, Nose, and Throat, 530.
Cabot's Guide to the Clinical Examination of the Blood, 162.
Cleland's Human Anatomy, 306.
Clouston's Clinical Lectures on Mental Diseases, 461.
Davis's Treatise on Obstetrics, 378.
Duhring's Cutaneous Medicine, 308.
Einhorn's Diseases of the Stomach, 78.
Ewald's Diseases of the Stomach, 458.
Fenwick's Disorders of Digestion in Infancy and Childhood, 457.
Foster and Shore's Physiology for Beginners, 534.
Foster's Reference Book of Practical Therapeutics, 456.
Frost's The Fundus Oculi, 372.
Gould and Pyle's Anomalies and Curiosities of Medicine, 235.
Gould's An Autumn Singer, 160.
Gray's Anatomy, Descriptive and Surgical, 740.
Gynecology, a System of, 312.
Hare's Practical Diagnosis, 379, 803.
System of Practical Therapeutics, 800.
Holt's Diseases of Infancy and Childhood, 306.
Hyde and Montgomery's Practical Treatise an Diseases of the Skin, 460.
Illoway's Constipation in Adults and Children, 741.
Keith's Fads of an Old Physician, 535.
Kelley's Lectures about Children, 803.
Kirstein's Autoscopy of the Larnyx and Trachea, 307.
Linnell's The Eye as an Aid in General Diagnosis, 456.
Lydston's Over the Hookah, 160.
McFarland's Text-Book upon the Pathogenic Bacteria, 77.
Medical and Surgical Report of the Presbyterian Hospital in the City of New York, 460.
Medical News Visiting List, 805.
Mitchell's Clinical Lessons on Nervous Diseases, 535.
Moure's The Free Opening of the Tympanum and its Annexes, 533.
Osler's Lectures on Angina Pectoris and Allied States, 532.
Principles and Practice of Medicine, 161.

Reviews :
Park's Treatise on Surgery, 373.
Phelps's Traumatic Injuries of the Brain and its Membranes, 805.
Preston's Hysteria and Allied Conditions, 530.
Pye's Elementary Bandaging and Surgical Dressing, 531.
Reynolds's Hygiene for Beginners, 534.
The Vertebrate Skeleton, 740.
Sajous's Annual of the Universal Medical Sciences, and Analytical Index, 532.
Saundby's Lectures on Renal and Urinary Diseases, 693.
Schaeffer's Anatomical Atlas of Obstetric Diagnosis and Treatment, 455.
Smith's Spinal Caries, 802.
Solly's Hand-Book of Medical Climatology, 459.
Stevens's Manual of Practice of Medicine, 531.
Stewart's The Diseases of the Male Urethra, 377.
Thayer's Lectures on the Malarial Fevers, 739.
Transactions of the American Climatological Association, 238.
of the American Laryngological Association, 238.
of the Colorado State Medical Society, 805.
of the Michigan State Medical Society for 1897, 742.
Tussey's High Altitude for Consumptives, 238.
Year-Book of Treatment for 1897, 238.
Ziegler's Text-Book of Special Pathological Anatomy, 806.
Rheumatic arthritis, acute surgical treatment of, **702.**
Rheumatism, acute articular, 762.
and rheumatoid arthritis, 713.
Rheumatoid arthritis, relation of, to diseases of the nervous system, etc., 713.
Richardson, G. H., M.D., report of a case of intussusception of the ileum in an adult, and a case of inflammation of long bones after an attack of cholera, **755.**
Richet, Professor Charles, the work of Pasteur and the modern conception of medicine, **566.**
Ricin and anti-ricin, 139.
Ricin intoxication, histological changes produced by, 784.
Rickets, the blood in, 448.
Rinderpest, Koch's researches on, 218.
Ringworm, formalin for, 203.
Rinné, negative, removal of drumhead and malleus in cases of, **264.**
Roddick, T. G., M.D., Canada, its medical life and resources, **558.**
Röntgen rays. *See* Skiascopy.
Rush, Dr. Benj., a student's notes of lectures by, **120.**

S.

Sailer, Jos., M.D., the condition of the blood in the cachexia of carcinoma, **404.**
Sarcoma of cutis of newborn, 790.
of pancreas, 42.
of uterus, 522.
Sarcomata, decidual, 787.
Sarcomatosis with purpura hæmorrhagica, 44.
Scarlatina, isolation in, unnecessary, 791.
severe joint affection after, 142.
streptococcus of, action of the serum of Marmorek upon, 765.
transmission of, by means of a letter, 296.
treated by ant streptococcic serum, 141.
with eruption limited to the face, 296.
Sciatica treated by hypodermics of glycerophosphates, 496.
Scurvy, infantile, 637.
Septicæmia hæmorrhagica, bacillus of, in an infected wound, 730.
Septicemia, puerperal, treatment of, by antistreptococcic serum, 227.
Serotherapeutics in recurrent fever, 136, 138.
Serotherapy of bubonic plague, 205.
Serum antipesteux treatment of epidemic plague, 720.
antipneumococcus, 206.
antistreptococcic, in treatment of puerperal fever, 524.
antituberculous, and its antitoxin, 293.
curative, for typhoid fever, scarlet fever, and pneumonia, 431.
diagnosis of typhoid fever, 130, 131.
eel, action of, 291.
reaction as a test for typhoid infection in water, 728.
treatment of diphtheria, 48.
of gangrene, 51.
of staphylomycosis, 763.
Skiagraphs as legal evidence, 303.
Skiagraphy, 49, 50.
in diagnosis of acromegaly, 58.
in surgery, **241.**
location by, of a foreign body in esophagus, **83.**
progress of, in 1896, 76.
Skiascopy in diagnosis, 49.
Specimens for museums, preserving natural color of, 63.
Speech defects as localizing symptoms, 442.
Spiller, William G., M.D., organic nervous diseases as neuronic diseases, **33.**
pathology of tabes dorsalis, **321.**
Spinal cord, descending degeneration in, 148.
law of the eccentric position of the long tracts in, 780.
partial rupture of, without fracture of spine, 510.
transverse lesions of, condition of patella reflex in, 149.
Spleen, lesions of, in cholera, 682.
wandering, 197.
Staphylococcus pyogenes aureus, immunization against, 445.
Staphylomycosis, immunization and serumtherapy in, 763.

State board examinations, 538.
Steel pins, use of, in surgical practice, 724.
Steele, J. Dutton, M.D., aneurism of the right posterior aortic sinus of Valsalva, with rupture, **258.**
review of the literature of Koch's tuberculin R, **756.**
Stenoses, incomplete pyloric and subpyloric, 659.
of the gut, multiple, of tuberculous origin, 672.
Stenosis, tricuspid, diagnostic sign of, 425.
Sterility from bilateral epididymitis, 668.
Stomach, carcinoma of, 192.
diagnosis of, from wash-water and vomit, 193.
some so-called diagnostic points of, **181.**
diseases of, behavior of pepsin in, 193.
foreign bodies in, 209, **484.**
motor insufficiency of, 275.
multiple tuberculosis of, 428.
secretory nerve of, 375.
ulcer of, treated by rectal nutrition, 204.
ulcer of, chronic, surgical treatment of, 674.
Stowe, Herbert, M.D., etiology and pathology of acute general peritonitis, **22.**
Streptococci, homology of, 215.
Streptococcus infection, lavage of the blood in, 204.
serum (Marmorek) and streptococcus toxin, 783.
Struma of root of tongue, 774.
Sulphonal poisoning, chronic, 52.
Summer residence in New England, choice of, **385.**
Sunstroke, meteorological conditions of, **465.**
Surgeon of old in war, **577.**
Surgery, military, in Greece, 725.
progress of, in 1896, 71.
Review of, 53, 142, 209, 277, 351, 433, 497, 668, 721, 767.
teaching of, **623.**
Suture, end-to-end, of injured arteries and veins, 143.
Sympathetic cervical, resection of, as treatment of Basedow's disease and of epilepsy, 439.
Symphysiotomy in the Baudelocque clinic, 155.
three cases of, 65.
Symptom-complex of Weber, a case with, 56.
Syringomyelia of scapulo-humeral type with integrity of sensation, 728.
Systolic heart-murmurs, 46.

T.

Tabes dorsalis and chronic lead-poisoning, 727.
causes of ataxia in, 727.
pathology of, **321.**
Tachycardia and its relation to uremia and Graves's disease, **649.**
Taka-diastase, action of, in gastric disorders, 496.
Taylor, A. E., M.D., the condition of the blood in the cachexia of carcinoma, **404.**
Temperature records in the puerperium, 521.
Tendo Achillis reflex, abolition of, in sciatica, 197.
Test-type, a perfected series of, **387.**
Tetanus, antitoxin of, 490.
treated with antitoxin, chloral, and Calabar bean, **342.**
Therapeutic potpourri, 537.
Therapeutics, progress of, in 1896, 73.
Review of, 51, 136, 201, 429, 493, 664, 715, 763.
Thigh, Bernhardt's disturbance of sensation in, 60, 363.
Thorax, diseases of, diagnosed by skiascopy, 49, 50, 346.
Throat, cystadenoma of, 775.
Thyroid gland, function of, 288.
Tinea, chloride of sodium treatment of, 719.
Tongue, root of, struma of, 774.
Tonsils, tuberculosis of, in children, 297.
Trachea, stenosis of, a symptom of, 135.
Transposition of the viscera, 221.
Tuberculin, general impressions from six years' use of, **639.**
Koch's new, 495, **756.**
preparations, new, 429.
R, Koch's, review of the literature of, **756.**
Tuberculosis of lymph-channels, 713.
pulmonary, diagnosis of, by skiascopy, 49.
heart-disease with, 45.
relation of rheumatoid arthritis to, 713.
Tumor, intracranial, 213.
of breast containing cartilage and bone, 785.
Tumors, fecal, 48.
malignant, treatment of, with streptococci cultures, 430.
nerves and other structures in, shown by "vital staining," 289.
ovarian. *See* Ovarian tumors.
pelvic and abdominal, peculiar relations of, 153.
Typhoid bacillus obtained from the blood during life, 682.
fever, bacteriological examination of the stools in, 731.
diagnosis of, by examination of the blood, 188.
by serum-test, 130, 131.
germs, transmission of, through the air, 663.
serum diagnosis of, 274.
soluble toxin of, 294.
vaccination against, 201.
infection in water, serum reaction as a test for, 728.
patients, distribution of agglutinating substance in organisms of, 788.
ulcer, perforating, surgical treatment of, 677.
Typhus abdominalis, diagnosis of, 422.

U.

Umbilicus, diphtheria of, 450.

Urine, incontinence of, in childhood, 222.
Urotropine in the treatment of cystitis and ammoniacal urine, 667.
Uterus, ante-fixation of, labor after, 68.
avulsion of, 454.
carcinoma of cervix of, in a girl of fourteen, 68.
treatment of, without operation, **332.**
inertia of, treatment of, by a new excito-dilator of cervix, 451.
inversion of, 523.
retroflexed, operation on, 524.
sarcoma of, 522.

V.

Vaccination, **709.**
Vaginal cystocle, operation for, 686.
Vaginitis gonorrhoica, 522.
Vagitus uterinus and first respiratory act, 732.
Van Cott, J. M., Jr., M.D., malignant chronic endometritis, **163.**
Van Harlingen, Arthur, M.D., report of five cases of erythematous hysterical dermatoneurosis, **695.**
Vertebral osteomyelitis, 54.
Vulva, myxoma of, 688.

W.

Warty growths of genitals, treatment of, 52.
Water, impure, relation of, to disease, 302.
Watson, Edward Willard, M.D., a medical lecturer of 1804, **120.**
a possible cause of gout, **344.**
Weber's symptom-complex, a case with, 56.
White, Frank, M.D., foreign body from the stomach of a boy, **484.**
Whittaker, James T., M.D., LL.D., general impressions from six years' use of tuberculin, **639.**
Whooping-cough, pathology of, 295.
Widal-Gruenbaum serum-test at post-mortems and in medico-legal cases, 239.
for diagnosis of typhoid fever, 130, 131.
Widal's reaction, examination of tissue of an embryo for, 187.
Wood, Horatio C., Jr., M.D., a case of tetanus, treated with antitoxin, chloral, and Calabar bean : recovery, **342.**
Wry-neck, cervical and thoracic nerve-roots in relation to, 781.

Y.

Yellow fever and the bacillus icteroides, 516.

WELLCOME LIBRARY INSTITUTE

BRITISH MEDICAL ASSOCIATION
Library